5-3895-219-10

TM 5-3895-219-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN: 16 CU FT (CONSTRUCTION MACHINERY MODEL 16 SM) FSN 3895-807-7985

This copy is a reprint which includes current pages from Changes 2 and 5

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1963

0101.11:

READEX FICHE best copy available

SAFETY PRECAUTIONS

BEFORE OPERATION

Be sure the area immediately below and above the skip is clear of objects and personnel prior to raising or lowering the skip.

Before operating the concrete mixer, be sure the wheels are blocked so that the unit cannot roll or slide.

Never make adjustments on the mixer without first being sure the engine clutch is disengaged and the enigne is shut off.

When filling the fuel tank, do not smoke or use an open flame in the vicinity. Always provide a metal-to-metal contact between the container and the fuel tank. This will prevent a spark being generated as fuel flows over metal surfaces. Failure to observe this warning may result in death to personnel.

DURING OPERATION

Do not place hands, head, or objects of any kind in or near the mixing drum while in motion.

Be sure the area immediately below and above the skip is clear of objects and personnel before raising or lowering the skip clutch.

AFTER OPERATION

Never make adjustments on the mixer without first being sure the engine clutch is disengaged and the engine is shut off.

When filling the fuel tank, do not smoke or use an open flame in the vicinity. Always provide a metal-to-metal contact between the container and the fuel tank. This will prevent a spark being generated as fuel flows over metal surfaces. Failure to observe this warning may result in death to personnel.

Changes in force: C 2 and C 5

TM 5-3895-219-10
*C 5

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *20 MAY 1980*

Operator's Manual
MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN 16 CU. FT. (CONSTRUCTION MACHINERY MODEL 16SM) (WATER-COOLED) NSN 3895-00-807-7985 (AIR-COOLED) NSN 3895-00-985-5335

TM 5-3895-219-10, 11 June 1963, is changed as follows:

Page 2. Paragraph 1c is superseded as follows:

c. Reporting Errors and Recommending Improvements. You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter or DA 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Tank-Automotive Materiel Readiness Command, ATTN: DRSTA-MBP, Warren, Michigan 48090. A reply will be furnished to you.

Paragraphs 1*d* and 1*e* are deleted.

Paragraph 2 is superseded as follows:

2. Forms and Records

DA Forms and records used for equipment maintenance will be only those prescribed in TM 38-750.

Page 11, paragraph 7*a*. The Caution is superseded as follows.

CAUTION

The water supply connection to the mixer must be 1 1/2 inch (pipe or hose connection). When using a non-pressurized water source (suction), the source must be level with or higher than the mixer. Standard type water hose may be used. Pump lift of over 48 inches is not recommended by the manufacturer.

Page 36, section III is superseded as follows:

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

45. Maintenance Forms and Records

Every mission begins and ends with the paperwork. There isn't much of it, but you have to keep it up. The forms and records you fill out have several uses. They are a permanent record of the services, repairs, and modifications made on your equipment; they are reports to organizational maintenance and to your commander; and they are a checklist for you when you want to know what is wrong with the equipment after its last use, and whether those faults have been fixed. For the information you need on forms and records, see TM 38-750.

46. Preventive Maintenance Checks and Services

a. Do your (B) PREVENTIVE MAINTE-

*This change supersedes C 3, 14 May 1968 and C 4, 20 June 1973.

NANCE just before you operate the mixer. Pay attention to the CAUTIONS and WARNINGS.

b. Do your (D) PREVENTIVE MAINTENANCE during operation. (During operation means to monitor the mixer and its related components/systems, while they are actually being operated.)

c. Do your (A) PREVENTIVE MAINTENANCE right after operating the mixer. Pay attention to the CAUTIONS and WARNINGS.

d. Do your (W) PREVENTIVE MAINTENANCE weekly.

e. Do your (M) PREVENTIVE MAINTENANCE once a month.

f. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.

g. Always do your preventive maintenance in the same order, so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

h. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW.

i. When you do your preventive maintenance, take along the tools you need to make all the checks. You always need a rag or two.

WARNING

Dry cleaning solvent SD-2, used to clean parts, is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 138°F.

(1) *Keep it clean.* Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use drycleaning solvent (SD-2) to clean metal surfaces. Use soap and water when you clean rubber or plastic material.

(2) *Bolts, nuts, and screws.* Check that they are not loose, missing, bent, or broken. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one loose, tighten it or report it to organizational maintenance.

(3) *Welds.* Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to organizational maintenance.

(4) *Electric wires and connectors.* Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good condition.

(5) *Hoses and fluid lines.* Look for wear, damage, and leaks. Make sure clamps and fittings are tight. Wet spots show leaks, of course, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to organizational maintenance.

j. It is necessary for you to know how fluid leakage affects the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn and be familiar with them and REMEMBER - When in doubt, notify your supervisor!

Leakage definitions for Operator/Crew PMCS

CLASS I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
CLASS II	Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
CLASS III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Of course, consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in your PMCS.

Class III leaks should be reported to your supervisor or to organizational maintenance.

Table 1. Operator/Crew Preventive Maintenance Checks and Services

B—Before D—During A—After W—Weekly M—Monthly

Item No.	Interval B	D	A	W	M	ITEM TO BE INSPECTED Procedure: Check for and have repaired, filled, or adjusted as needed	Equipment is not ready/ available if:
						NOTE PERFORM WEEKLY AS WELL AS BEFORE PMCS's IF: *a.* You are the assigned operator but have not operated the mixer since the last weekly. *b.* You are operating the mixer for the first time.	
	•					MAKE THE FOLLOWING WALK AROUND CHECKS: *a.* Check for evidence of leakage (oil, fuel, coolant, or water from mixer water system) on or under the mixer.	Class III leaks or any fuel leakage.
				•		*b.* Check tires for damage or low pressure. (Correct pressure is 45 psi).	
	•					*c.* Check that fire extinguisher is in proper place and has proper pressure. (See TB 5-4200-200-10.)	
	•					*d.* Visually check for loose, missing, or damaged parts.	
2				•		RADIATOR (Water Cooled Engine) Check coolant level. Fill to overflow.	
3				•		BELTS Inspect fan, generator drive V-belt for frayed or cracked condition.	Belt missing or broken.
4					•	HOIST CABLE AND PULLEYS Check for cracked, bent, or broken parts. Check for worn or frayed cables.	Broken wires in cable.
5				•		FUEL STRAINER Clean strainer and inspect condition of gasket.	
6				•		BATTERIES Check level of electrolyte. If low, fill with clean water (distilled if possible) to the split ring. In freezing weather, run engine at least 15 minutes after adding water.	
7						INSTRUMENTS Check for normal operating readings on the instruments as follows:	
		•				*a.* COOLANT TEMPERATURE gage ..... 160°to 180° F (Water cooled engine)	
		•				*b.* OIL PRESSURE gage: Water cooled engine ..... 20 to 30 psi Air cooled engine ..... 4 to 5 psi	
		•				*c.* TACHOMETER ..... 2200 rpm (maximum)	
		•				*d.* AMMETER ..... Slight charge	
		•				*e.* FUEL gage ..... Indicates amount of fuel in tank	
			•			MIXING DRUM Clean drum inside and out using a hose and brush.	

Page 37. Figure 22, deleted.

Page 47. Appendix I is superseded as follows:

APPENDIX I
REFERENCES

1. Fire Protection

TB 5-4200-200-10 Hand Portable Fire Extinguisher

2. Lubrication

LO 5-3895-219-20-1
LO 5-3895-219-20-2
LO 5-3895-219-20-3 Mixer, Concrete, Trailer Mounted: Gasoline Driven 16 Cu. Ft. (Construction Machinery Model 16SM) NSN 3895-00-807-7985, NSN 3895-00-985-5335

C9100-IL Fuels, Lubricants, Oils, and Waxes

3. Painting

TM 43-0139	Painting Instructions for Field Use

4. Maintenance

TM 9-6140-200-14	Storage Batteries Lead-Acid Type
TM 38-750	The Army Maintenance Management System (TAMMS)
TB 750-651	Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems

5. Shipment and Storage

TB 740-97-2	Preservation of USAMECOM Mechanical Equipment for Shipment and Storage.
TM 740-90-1	Administrative Storage of Mechanical Equipment

Page 48. Appendix II is superseded as follows:

APPENDIX II
BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST
Section I. INTRODUCTION

1. Scope

This appendix lists items required by the operator for operation of the mixer.

2. General

This list is divided into the following sections:

a. Basic Issue Items List – Section II. Not applicable.

b. Items Troop Installed or Authorized List – Section III. A list of items in alphabetical sequence, which at the discretion of the unit commander may accompany the mixer. These items are NOT SUBJECT TO TURN-IN with the mixer when evacuated.

3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items List, Section II, and Items Troop Installed or Authorized List, Section II.

a. Source Maintenance and Recoverability Code(s) (SMR): (Not applicable).

b. National Stock Number. This column indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/M). A two character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Furnished with Equipment (BIIL). (Not applicable).

f. Quantity Authorized (Items Troop Installed or Authorized). This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR code	(2) National stock number	(3) Description Ref. No. & Mfr. code / Usable on code	(4) Unit of meas	(5) Qty auth
	4210-00-555-8837	Extinguisher, Fire	EA	1

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25B Operator maintenance requirements for Mixer, Concrete.

*TM 5-3895-219-10
C 2

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *23 January 1968*

Operator's Manual

MIXER, CONCRETE, TRAILER MOUNTED:

GASOLINE DRIVEN 16 CU. FT.

(CONSTRUCTION MACHINERY MODEL 16SM,

(WATER-COOLED) FSN 3895-807-7985

(AIR-COOLED) FSN 3895-985-5335

TM 5-3895-219-10, 11 June 1963, is changed as follows:

The title is changed to read as shown above.

Page 2, paragraph 1*c* is superseded as follows:

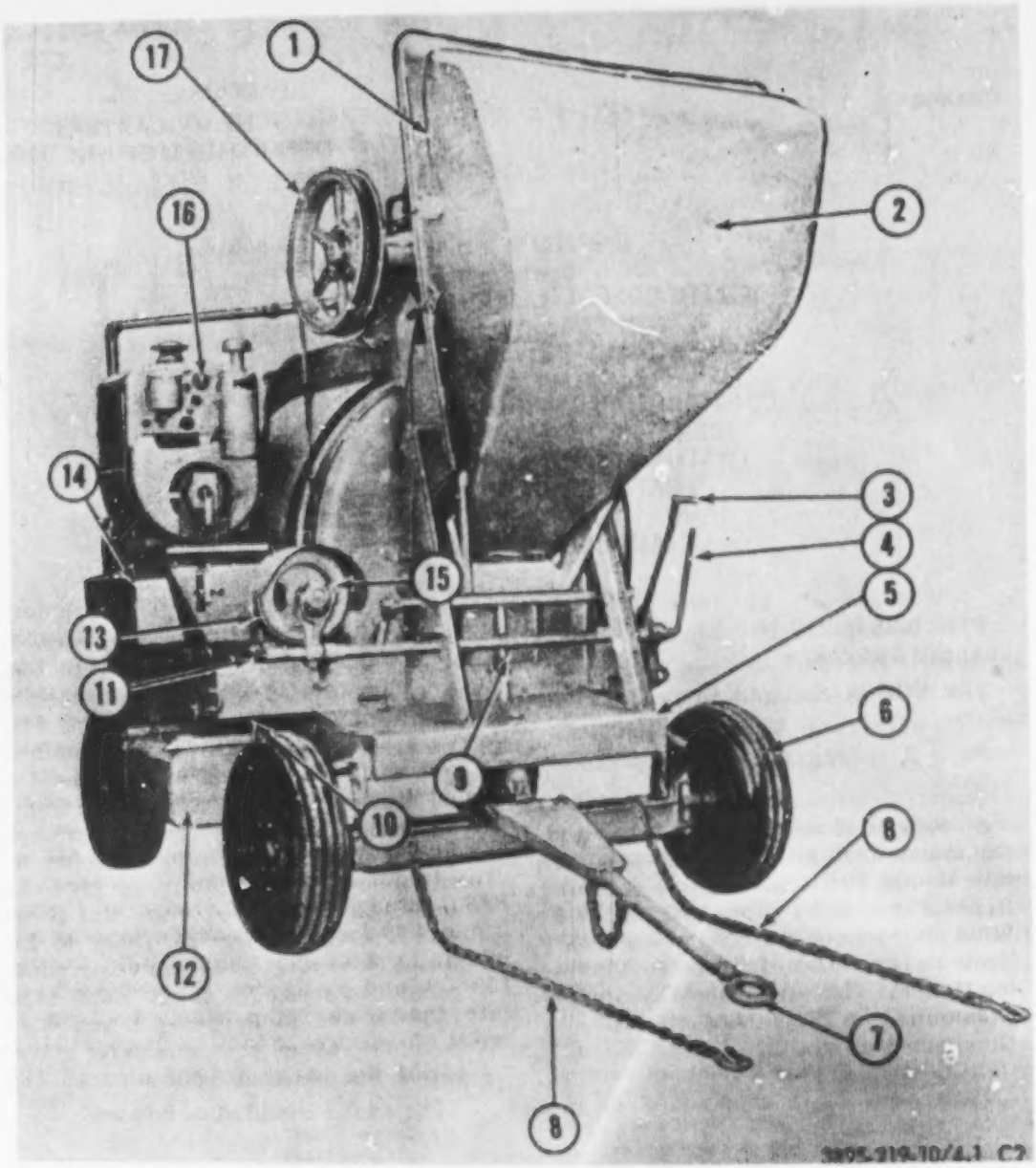
c. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Blvd., St. Louis, Mo. 63120.

Paragraph 3*a* is superseded as follows:

a. General. The Construction Machinery Company Model 16SM Concrete Mixer is a self-contained wheeled unit, portable by towing. Differences existing within this model, and designated by serial number ranges, are set forth in paragraphs 4 and 5 as well as other appropriate paragraphs. Since the general design and arrangement are identical, illustration callouts will, in the following description, be given for figures 1 and 2 only (serial No. range 14-8883 through 148982). Refer to Figures 3 and 4 to locate the same components of mixers in serial No. range 153351 through 153609, and to figures 4.1 and 4.2 to locate the same components of mixers in serial No. range 184869 through 185154.

Figure 4.1 is added as follows:

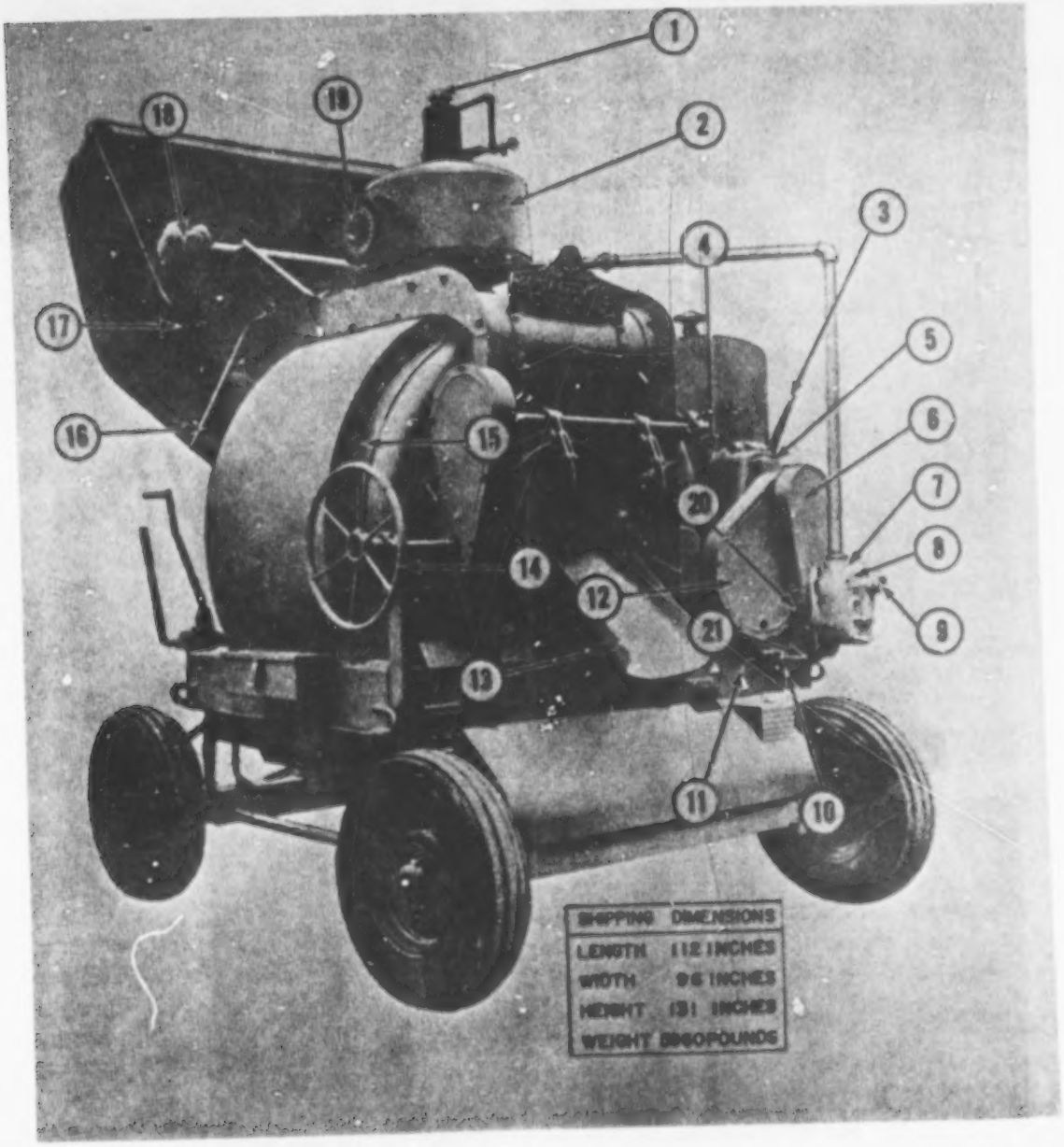
*This change supersedes C 1, 21 April 1965.



1 Skip hoist cable
2 Loading skip
3 Skip clutch lever
4 Skip brake lever
5 Truck frame
6 Pneumatic tired wheel (4)
7 Towing tongue
8 Towing safety chain (2)
9 Skip bumper
10 Skip brake spring
11 Brake spring eyebolt
12 Fuel tank
13 Skip brake
14 Battery box
15 Skip clutch
16 Engine
17 Hoist cable pulley

Figure 4.1. Mixer, right front view (serial No. range 184869 through 185154).

Figure 4.2 is added as follows:



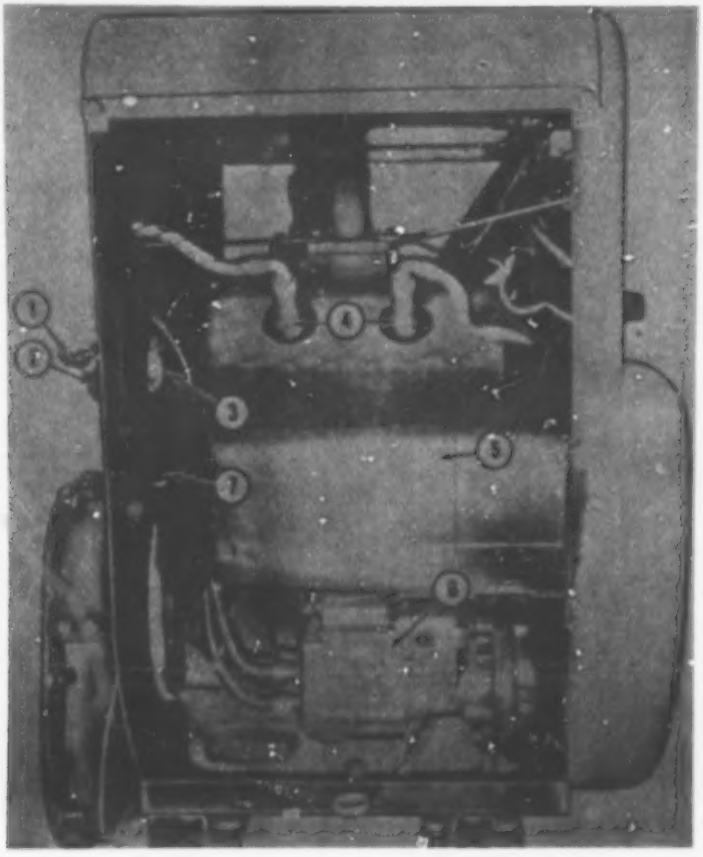
1 Water tank air valve
2 Water tank
3 Engine clutch lever
4 Engine clutch
5 Power transfer gear assembly
6 Pump drive belt guard
7 Dual prime pump priming plug
8 Dual prime pump
9 2-inch input port
10 Pump mounting nut (4)
11 Main frame
12 Main drive assembly
13 Discharge chute
14 Discharge chute handwheel
15 Mixing drum
16 Water valve control
17 Skip safety chain (2)
18 Skip cable spool
19 Water volumn control
20 Belt guard support
21 Pump bracket

Figure 4.2 Mixer, left rear view and shipping dimensions (serial No. range 184869 through 185154).

Paragraph 3*d*. In line 3 after "Mixer" the following is added: (serial No. range 148883 through 148982 and 153351 through 153609).

Page 9, paragraph 3*d*. In line 3 after "lever (2)" the following is added: One model Wisconsin engine is used as the power source for the Model 16SM Cement Mixer (serial No. range 184869 through 185154). Figure 6.1 shows the Wisconsin Model MVF4D engine. This engine is a four-cylinder, air-cooled engine equipped with an electric starter, magneto [(6), fig 6.1] and governor. The carburetor provides correct fuel-air ratio for all speeds and loads. In addition, the Model MVF4D engine incorporates a fuel strainer (2) and shutoff valve (1), and a fuel pump (3). Power is transferred to the main drive assembly [(12), fig 4.2] through a disk-type clutch (4) incorporated in a power transfer gear assembly (5). The clutch is engaged and disengaged by the engine clutch lever [(4), fig 6.2].

Figure 6.1 is added as follows:

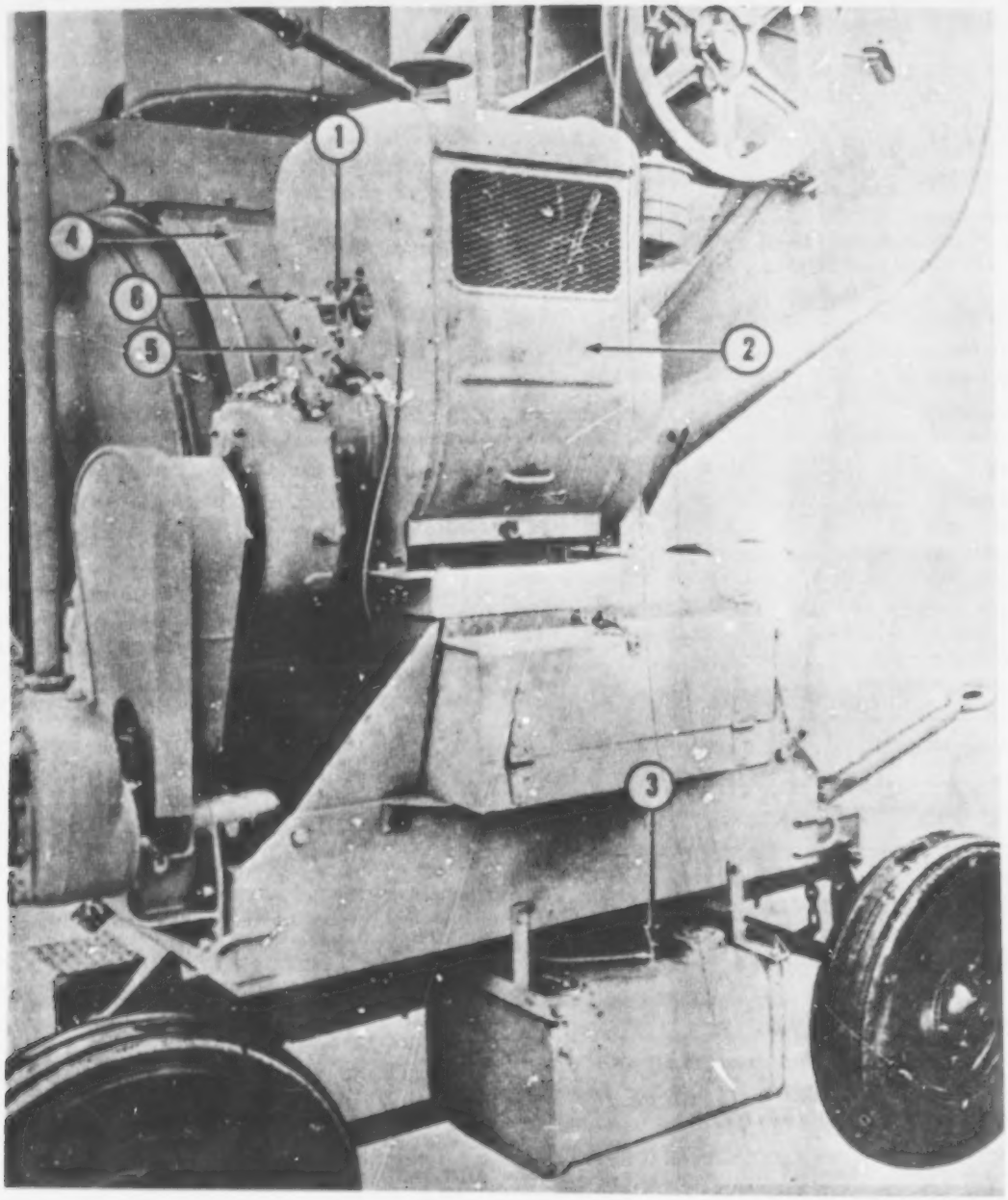


3895-219-10 6.1 C2

1 Fuel shutoff valve
2 Fuel strainer
3 Fuel pump
4 Spark plug (4)
5 Engine shroud
6 Magneto
7 Crankcase breather

Figure 6.1 Engine, Model MVF4D, right side view (serial No. range 184869 through 185154).

Figure 6.2 is added as follows:



3895-219-10/6.2 C2

1 Fuel strainer
2 Side panel
3 Fuel tank shutoff valve
4 Engine clutch lever
5 Primer control
6 Fuel strainer shutoff valve

Figure 6.2. Engine, Model MVF4D, right rear view (serial No. range 184869 through 185154).

Paragraph 4b(2). (As changed by C 1, 21 Apr 65). In line 2 of title, change "148883" to read "153351"

In paragraph 4*b*, the following is added after paragraph 4*b*(2):

(2.1) *Corps of Engineers data plate A (serial No. range 184869 through 185154,*

Nomenclature	Mixer, Concrete, Trailer Mtd, G.E.D., Non-tilting, 16 cu ft, End Discharge
Stock No	3895-985-5335
Serial No	
Registration No	
Manufacturer	Construction Machinery Co.
Model	16SM
Contract No	DA 23-195-AMC-01019(T)
Date Manufactured	
Length	112
Width	96
Height	131
Capacity or payload	16 cu ft
G.V.W.	5960
Shipping weight	5960
Cube	815
Engine manufacturer	Wisconsin Motor Corp.
Model	MVF4D
Engine serial No	

Paragraph 4*b*(3). (As changed by C 1, 21 Apr 65) In line 2 of title, change "15-3351" to read "148883".

In paragraph 4*b* the following is added after paragraph 4*b*(4):

(4.1) *Engine manufacturer's data plate (serial No. range 184869 through 185154).*

Manufacturer	Wisconsin Motor Corp.
Model	MVF4D
Size	3-1/4 x 3-1/4
Serial No	
Specification	287717
Net Cont. BHP	18.2
RPM	2200
Date	

Page 10, paragraph 4b. **The following is added after paragraph 4*b*(9):**

(9.1) *Engine (serial No. range 184869 through 185154).*

Manufacturer	Wisconsin Motor Corp.
Model	MVF4D

In paragraph 4*b*. The following is added to title of (10) after "Capacities": *(serial No. range 148883 through 148982 and 153351 through 153609).*

The following is added after paragraph 4*b*(10):

(10.1) *Capacities (serial No. range 18-4869 through 185154).*

Fuel Tank	15 gal
Engine Crankcase	4 qt
Air Cleaner	1 qt
Oil Filter	1 qt
Power Transfer Gear Housing	1 qt
Chain Case	3/4 qt

In paragraph 4*b*. the following is added to title of (12) after "Tire inflation": *(serial No. range 148883 through 148982 and 153351 through 153609).*

The following is added after paragraph 4*b*(12):

(12.1) *Tire inflation (serial No. range 184869 through 185154.*

Front	32 psi
Rear	32 psi

In paragraph 4*b* the following is added to title of (14) after *"Adjustment data"*: *(serial No. range 148883 through 148982 and 153351 through 153609).* (As added by C 1, 21 Apr 65)

Paragraph 4*b*(14), line 1. After (inch) add deflection.

The following is added after paragraph 4*b*(14):

(14.1) *Adjustment data (serial No. ranges 184869 through 185154).*

Generator Drive V-Belt	1/2 to 3/4 inch deflection at midpoint

Paragraph 5 is superseded as follows:

5. Differences in Models

This manual covers the Construction Machinery Company Model 16SM Concrete Mixer, serial No. range 148883 through 148982, 153351 through 153609, and 184869 through 185154. Serial No. range 148883 through 148982 and 153351 through 153609 have water-cooled engines; serial No. range 184869 through 185154 have air-cooled engines. The variation in the engines is also reflected in the control panel. Specific differences, designated by serial number range, are set forth in appropriate paragraphs throughout this manual. When no serial number range appears in a paragraph, the paragraph refers to all serial number ranges. Illustrations, if not specifically noted, are of mixers in serial No. range 148883 through 148982, and the components shown are approximately identical in all serial number ranges.

Page 11. In paragraph 6*e*, line 1, the following is added after *e*: *Serial No. Range 148883 Through 148982 and 153351 Through 153609 Only.*

Page 14. In paragraph 8, the following is added after paragraph 8*b*(5):

b.1. Preparation for Movement (Serial No. Range 184869 Through 185154):

(1) Perform *a*(1) and *a*(2) above.

(2) Open draincock on fuel tank [(12), fig. 4.1] and drain all the fuel into a suitable container. Close draincock.

(3) Perform *a*(6) through *a*(8) above.

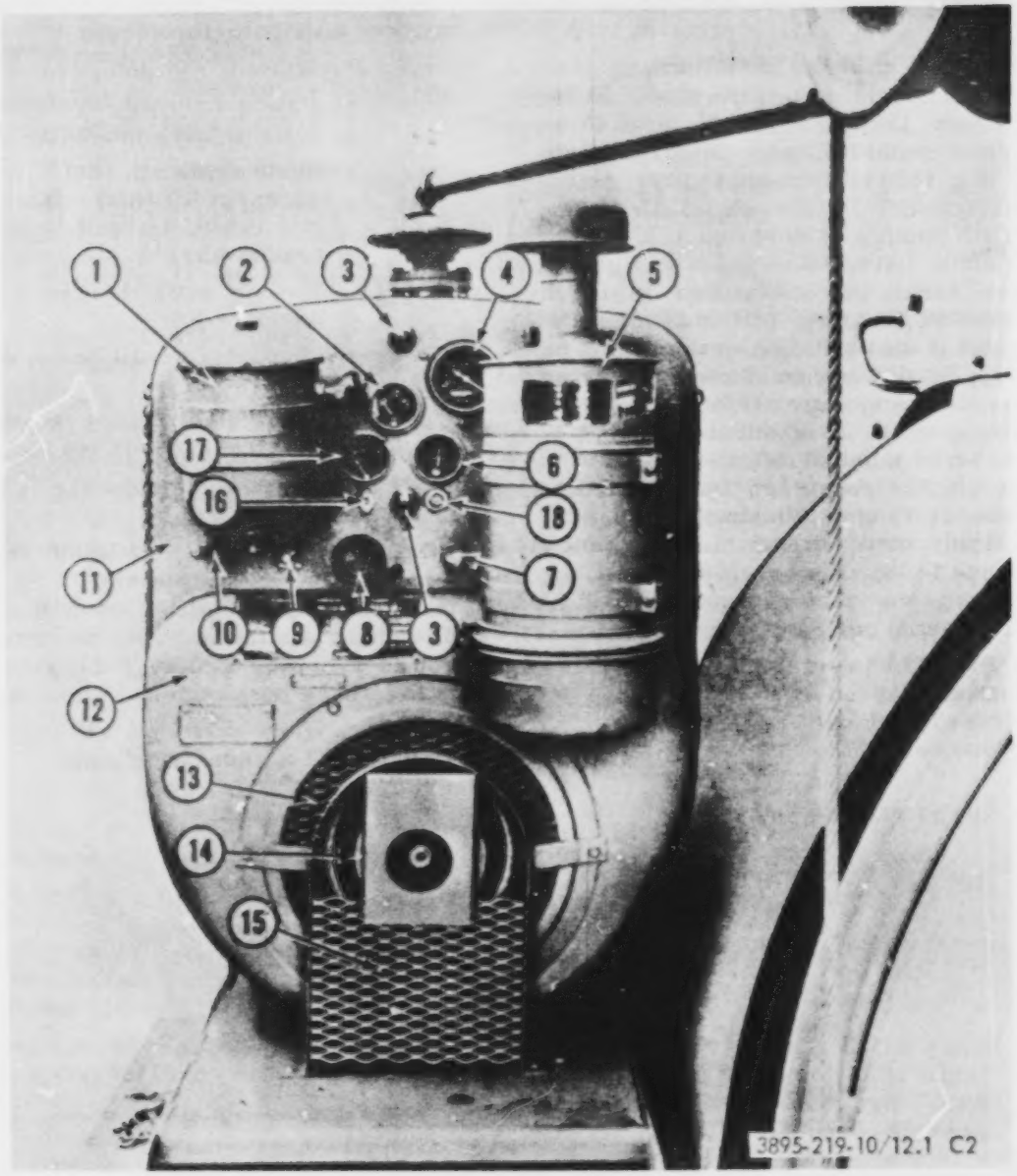
Page 14. In paragraph 10, line 1, the following is added:

a. Serial No. Range 148883 Through 148982 and 153351 through 153609.

In paragraph 10, the following is added below note:

b. Serial No. Range 184869 Through 185154. The choke control [(7), fig. 12.1] is a manually operated push-pull control. The choke control operates the carburetor and is used when starting the engine. OUT is full choke position and IN the choke is open.

Figure 12.1 is added as follows:



1 Oil filter
2 Fuel gage
3 Panel light
4 Tachometer
5 Air cleaner
6 Indicator, battery-generator
7 Choke control
8 Throttle control
9 Magneto switch
10 Starter switch
11 Panel
12 Flywheel shroud
13 Flywheel shroud screen
14 Pulley
15 V-belt
16 On-off switch
17 Oil pressure gage
18 Warning light

Figure 12.1. Engine, Model MVF4D, control panel end (serial No. range 184869 through 185154.)

Page 14. In paragraph 11, line 1, the following is added:

a. Serial No. Range 148883 Through 148982 and 153351 Through 153609.

Page 15. In paragraph 11, the following is added below line 3:

b. Serial No. Range 184869 Through 18-5154. The throttle control [(8), fig. 12.1] is a manually operated locking type control. Turning knob in a clockwise direction locks the control in desired position. The throttle control is connected to the carburetor and is used, together with the governor, to control the engine speed. To place the control in the "Run" position, pull the control out; to place it in the "Idle" position, push the control in.

In paragraph 12, line 1, the following is added:

a. Serial No. Range 148883 Through 14-8982 and 153351 Through 153609.

In paragraph 12, the following is added below line 4:

b. Serial No. Range 184869 Through 18-5154. The magneto switch [(9), fig. 12.1] is a push-pull type switch located on the control panel (11). Pulling the switch outward turns on the ignition.

In paragraph 13, line 1, the following is added:

a. Serial No. Range 148883 Through 14-8982 and 153351 Through 153609.

In paragraph 13, the following is added below line 4:

b. Serial No. Range 184869 Through 185154. The starter switch [(10), fig. 12.1] is a spring-loaded push-button type switch located on the control panel (11). Depressing the switch actuates the electric starting motor.

In paragraph 14, line 1, the following is added:

a. Serial No. Range 148883 Through 14-8982 and 153351 Through 153609.

In paragraph 14, the following is added below line 9:

b. Serial No. Range 184869 Through 185154. The tachometer and time totalizing meter [(4), fig. 12.1], located on the control panel (11), is a combination engine speed indicator and engine operating time recorder. The tachometer is a needle indicating gage graduated from 0 to 45 in increments of 100 rpm. The time totalizing meter is a tumbler-wheel instrument which totals engine operating time in hours, tenths of hours, and hundredths of hours.

In paragraph 15, line 1, the following is added:

a. Serial No. Range 148883 Through 14-8982 and 153351 Through 153609.

In paragraph 15, the following is added below line 6:

b. Serial No. Range 184869 Through 18-5154. The oil pressure gage [(17), fig 12.1], located on the control panel (11), is a special needle indicating 5-pound gage with on-off dial. Normal operating pressure is 4 to 5 psi.

In paragraph 16, the following is added after the paragraph title: (Serial No. Range 148883 Through 148982 and 153351 Through 153609 only).

Page 16. In paragraph 17, line 1, the following is added:

a. Serial No. Range 148883 Through 14-8982 and 153351 Through 153609.

In paragraph 17, the following is added below line 9:

b. Serial No. Range 184869 Through 185154. The battery-generator indicator [(6), fig. 12.1] is a needle indicating meter. The face has colored segments for easy reading. The meter indicates the voltage output of the generator and condition of the battery. When engine is not running and battery is in good condition, needle will be in yellow area. When engine is running fast idle and generator and regulator are working properly, needle will be in green area. If battery is dead or indicator is disconnected, needle will be in lower red area.

The following is added after paragraph 18.

18.1. Fuel Gage (Serial No. Range 184869 Through 185154)

The fuel gage [(2), fig. 12.1] is located on the control panel (11).

Paragraph 19*a*. (As changed by C 1, 21 Apr 65) In line 3, "(9)" is changed to read "(10)".

In paragraph 19, the following is added below *b*, line 5:

c. Serial No. Range 184869 Through 185154. The fuel tank shutoff valve [(3), fig. 6.2] when turned fully clockwise, shuts off fuel to the fuel strainer (1). The fuel strainer and shutoff valve (6) when turned fully clockwise, shuts off fuel to the fuel pump.

Page 17. In paragraph 22, line 1, the following is added:

a. Serial No. Range 148883 Through 148982 and 153351 Through 153609.

In paragraph 22, the following is added below the note.

b. Serial No. Range 184869 Through 185154. The engine clutch lever [(4), fig. 6.2] is located on the clutch housing at the rear of the engine. The forward position, towards the engine, disengages the clutch.

Page 18, paragraph 24. (As changed by C 1, 21 Apr 61) In line 7, "weight-pushing" is changed to read "weight. Pushing".

After paragraph 30*a*(6) add the following:

(7) If fuel from tank is to be utilized (serial No. range 184869 through 185154), open fuel tank shutoff valve [(3), fig. 6.2] and fuel strainer shutoff valve (6).

In paragraph 30*b*, line 1, the following is added after *"Engine": (Serial No. Range 148883 through 148982 and 153351 Through 153609).*

Page 19. In paragraph 30, the following is added below the note under *b*(8):

b.1. Starting the Engine (Serial No. Range 184869 Through 185154).

(1) Remove both engine side panels (2), fig. (11.1) to allow circulation around engine.

(2) Make certain the engine clutch is disengaged (para 22).

(3) Make certain the fuel tank and fuel strainer shutoff valves are fully open (para 19).

(4) If the engine is cold, pull the chock control (7) (fig. 12.1) to extreme "out" position.

Note. When starting a new engine for the first time, or when engine has been out of operation for a while, the hand primer ((5), fig. (11.1) should be used to pump gasoline into dry carburetor. When priming, a distinct resistance of the fuel pump diaphragm should be felt when operating the primer control (5). If this is not the case, the engine should be turned over a revolution so that the fuel pump cam will be rotated from its upper position, which would prevent priming. (When the carburetor is full, the primer control will move easily).

(5) Set the throttle control (8) (fig. 12.1) at one quarter of full throttle.

(6) Pull the magneto switch (9) outward.

(7) Press the starter switch (10).

(8) As the engine starts to warm up, push the throttle control all the way in to idle speed and gradually push in the choke control until it is all the way in. The choke control should always be pushed in after the engine has warmed up.

In paragraph 31*a*, the following is added below

Note. On cement mixers in serial No. range 184869 through 185154, the clutch is disengaged by pushing the engine clutch lever ((4), fig 6.2 toward engine.

In paragraph 31*b*, the following is added below

Note. On cement mixers in serial No. range 184869 through 185154, push in the magneto switch ((9), fig. No. (12.1) to stop the engine.

Page 21. In paragraph 33*a*, line 1, the following is added after *"Engine": (Serial No. Range 148883 Through 148982 and 153351 Through 153609.*

In paragraph 33, the following is added below *a* (2), line 3:

a.1. Engine (Serial No. Range 184869 Through 185154).

(1) *Cooling system.* Keep the engine clean and free from dust. Check

the flywheel shroud screen (13), (fig. 12.1), flywheel shroud (12), and the engine shrouds (5), (fig. 6.1) to see that all air passages are free of obstructions. See that shroud sections are not dented or missing. Remove the engine side panels (2), (fig. 6.2) when operating the engine and mixer.

(2) *Lubrication.* Lubricate the engine in accordance with the current lubrication order.

In paragraph 34*a*, the following is added after (5).

Note. Paragraph 34*a*(5) is applicable to mixers in serial No. range 148883 through 148982 and 153351 through 153609 only.

Page 22. In paragraph 36, the following is added after *c*.

Note. Paragraph *c* is applicable to mixers in serial No. range 148883 through 148982 and 153351 through 153609 only.

In paragraph 38, the following is added after *c*.

Note. Paragraph 38*c* is applicable to mixers in serial No. range 148883 through 148982 and 153351 through 153609 only.

Page 23. In paragraph 40, the following is added to the paragraph title after "153609": and 184869 Through 185154

Page 24. Paragraph 43*b* is superseded as follows

b. The lubrication order (LO 5-3839-219-20-1), shown in figure 17, and reference numbers 1 through 23 are applicable to mixers in all serial No. ranges. Reference numbers 24 through 35 are applicable to mixers in serial No. range 14883 through 14892 and 153351 through 153609 only. Reference numbers 36 through 43 are applicable to serial no. range 184869 through 185154 only.

In paragraph 44*c*. In line 3, "33" is changed to read "43".

In paragraph 44*d*. (As changed by C 1, 21 Apr 65) In line 5, change "(ref. 15)" to read "(ref. 18)".

Pages 25 and 26. LO 5-3895-219-20-1 is superseded as follows:

LUBRICATION ORDER

LO 5-3895-219-20-2

19 MAY 1967 Supersedes LO 5-3895-219-20-2 14 June 1963)

MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN; 16 CU FT (CONSTRUCTION MACHINERY MODEL 16 SM) W ENGINE CONTINENTAL MODEL YS116 OR WISCONSIN ENGINE MODEL MVF4D

Reference: LO 5-3895-219-20-1, 3; C9100 IL

Intervals are based on normal hours of operation. Adjust to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Drain crankcase when hot. Fill and check level.

Dotted circle indicates drain below.

LUBRICANT • INTERVAL

FOLD

(24) Engine Drain Plug (Drain and refill) — 100

Generator (Sealed bearings, no lubrication required)

(25) Starter (Sparingly) — OE 500

(26) Air Cleaner (Refill oil reservoir to level mark, every 50 hours; disassemble entire unit, clean, re-oil and reassemble) (See key) (below serial No. 148983) — OE 10

(27) Clutch Shifter Yoke — OE 50

(28) Clutch Bearing (Sparingly) — GAA 50

(29) Gear Housing Level Plug (Check level) — 10

INTERVAL • LUBRICANT

FOLD

100 — (30) Oil Filter (Disassemble, clean housing, renew element and reassemble) (See note 2)

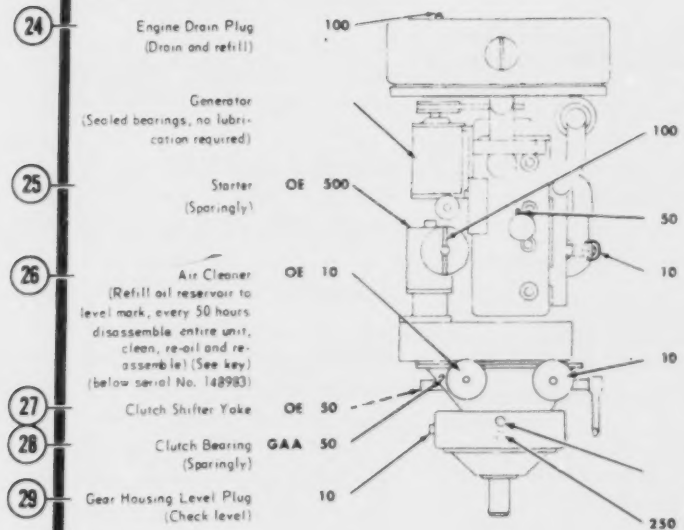
50 GAA — (31) Tachometer Drive (Turn cup down 1 turn)

10 OE — (32) Oil Fill Cap and Level Gage (Check level) (See key)

10 OE — (33) Air Cleaner (Refill oil reservoir to level mark, every 50 hours; disassemble entire unit, clean, re-oil and reassemble) (See key) (above serial No. 153350)

GO — (34) Gear Housing Fill Plug (See key)

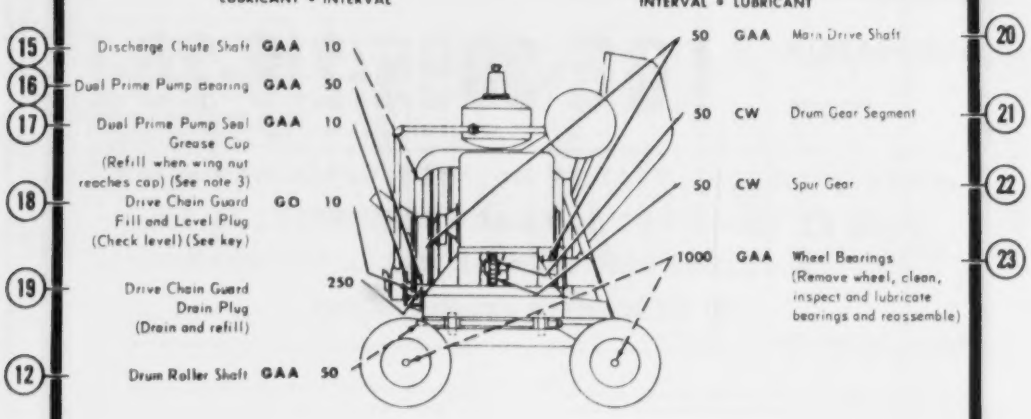
250 — (35) Gear Housing Drain Plug (Drain and refill)



MEC 3895-219-10/17 ③ C2

Front

Figure 17① Lubrication order.


LUBRICANT • INTERVAL
INTERVAL • LUBRICANT
15 Discharge Chute Shaft GAA 10
16 Dual Prime Pump bearing GAA 50
17 Dual Prime Pump Seal Grease Cup (Refill when wing nut reaches cap) (See note 3) GAA 10
18 Drive Chain Guard Fill and Level Plug (Check level) (See key) GO 10
19 Drive Chain Guard Drain Plug (Drain and refill) 250
12 Drum Roller Shaft GAA 50
50 GAA Main Drive Shaft 20
50 CW Drum Gear Segment 21
50 CW Spur Gear 22
1000 GAA Wheel Bearings (Remove wheel, clean, inspect and lubricate bearings and reassemble) 23

FOLD FOLD

– KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F	+40°F to –10°F	0°F to –65°F	
OE –OIL, Engine, Heavy Duty		OE 30	OE 10	OES	Intervals given are in hours of normal operation.
Oil Can Points					
OES –OIL, Engine, Subzero					
GO –LUBRICATING OIL, Gear		GO 90	GO 90	GOS	
Drive Chain Guard	3/4 qt				
GOS –LUBRICATING OIL, Gear, Subzero					
GAA –GREASE, Automotive and Artillery		All Temperatures			
CW –LUBRICATING OIL, Exposed Gear					

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW –10°F. Remove lubricants prescribed in the key for temperatures above –10°F. Relubricate with lubricants specified in the key for temperatures below –10°F.

2. OIL CAN POINTS. Every 50 hours clean and lightly coat the control linkage and all exposed adjusting threads with OE.

3. GREASE CUP. To fill cup turn wing nut clockwise to cap, remove cap, fill cup, replace cap and turn wing nut counterclockwise to top of shaft.

4. LUBRICANTS. The following is a list of lubricants with the Military Symbols and applicable specification numbers.

OE-MIL-L-2104	GOS-MIL-L-10324
OES-MIL-L-10295	GAA-MIL-G-10924
GO-MIL-L-2105	CW-VV-L-751

Copy of this Lubrication Order will remain with the equipment at all times, instructions contained herein are mandatory.

BY ORDER OF THE SECRETARY OF THE ARMY:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

OFFICIAL:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

MEC 3895–219–10/17 ② C2

Rear

Figure 17 ②—Continued

Pages 27 and 28. LO 5-3895-219-20-2 is superseded as follows:

LUBRICATION ORDER

LO 5-3895-219-20-1

19 May 1967 (Supersedes LO 5-3895-219-20-1, 14 June 1963)

MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN; 16 CU FT (CONSTRUCTION MACHINERY MODEL 16 SM) W/ENGINE CONTINENTAL MODEL YS116 OR WISCONSIN ENGINE MODEL

Reference: LO 5-3895-219-20-2, 3. C9100-IL

Intervals are based on hours of normal operation. Adjust to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

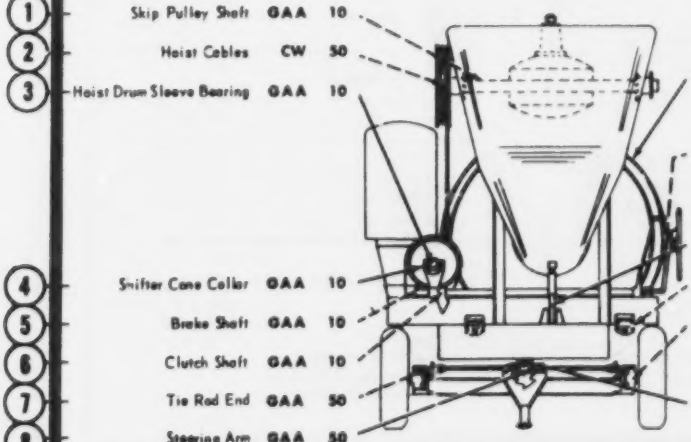
Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of the equipment.

FOLD FOLD

	LUBRICANT • INTERVAL				INTERVAL • LUBRICANT			
1	Skip Pulley Shaft	GAA	10		50	OE	Discharge Roller Chain (Remove plug in top of chain guard to lubricate)	9
2	Hoist Cables	CW	50		10	GAA	Handwheel Shaft	10
3	Hoist Drum Sleeve Bearing	GAA	10		10	GAA	Skip Bumper	11
4	Shifter Cone Collar	GAA	10		50	GAA	Drum Roller Shaft	12
5	Brake Shaft	GAA	10		50	GAA	King Pins	13
6	Clutch Shaft	GAA	10					
7	Tie Rod End	GAA	50		50	GAA	Tie Rod Center Pivot Pin	14
8	Steering Arm (Sparingly)	GAA	50					



MEC 3895-219-10/17 ① C2

Front

Figure 17③—Continued.

— KEY —

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F	+40°F to −10°F	0°F to −65°F	
OE -OIL, Engine, Heavy Duty					
Crankcase	5-1/2 qt	OE 30	OE 10	OES	Intervals given are in hours of normal operation.
Air Cleaner (below serial No 148883)	1/2 qt				
Air Cleaner (above serial No 153350)	1 qt				
Oil Can Points					
OES OIL, Engine, Subzero					
GO LUBRICATING OIL, Gear		GO 90	GO 90	GOS	
Gear Housing	1-1/2 qt				
GOS LUBRICATING OIL, Gear, Subzero					
GAA -GREASE, Automotive and Artillery		All Temperatures			

FOLD FOLD

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10 F. Remove lubricants prescribed in the key for temperatures above -10 F. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. OIL FILTERS. After installing new filter elements, fill crankcase, operate engine 5 minutes, check housings for leaks, check crankcase oil level and bring to full mark.

3. OIL CAN POINTS. Every 50 hours clean and lightly coat the governor, control linkages and all exposed adjusting threads with OE.

4. LUBRICANTS. The following is a list of lubricants with the Military Symbols and applicable specification numbers.

OE-MIL-L-2104
OES-MIL-L-10295
GO-MIL-L-2105
GOS MIL L 10324
GAA MIL L 10924

Copy of this Lubrication Order will remain with the equipment at all times, instructions contained herein are mandatory.

BY ORDER OF THE
SECRETARY OF THE ARMY:

HAROLD K. JOHNSON
General, United States Army,
Chief of Staff.

OFFICIAL

KENNETH G. WICKHAM
Major General, United States Army,
The Adjutant General

MEC 3895-219-10/17 ④ C2

Rear

Figure 17 ④—Continued.

LO 5-3895-219-20-3 is added after LO 5-3895-219-20-2 as follows:

LUBRICATION ORDER

LO 5-3895-219-20-3

19 MAY 1967

MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN; 16 CU FT (CONSTRUCTION MACHINERY MODEL 16 SM) W/ENGINE CONTINENTAL MODEL YS116 OR WISCONSIN ENGINE MODEL MVF4D

Reference: LO 5-3895-219-20-1, 2; C9100-IL

Intervals are based on normal hours of operation. Adjust to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubrication.

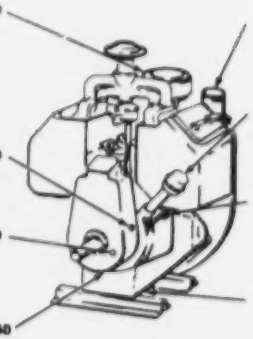
Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with Oil fuel, Diesel. Dry before lubricating.

Drain crankcase when hot. Fill and check level.

FOLD FOLD

LUBRICANT	INTERVAL		INTERVAL	LUBRICANT	
Air Cleaner (Refill oil reservoir to level mark every 50 hours, disassemble entire unit, clean, re-oil and reassemble.) (See Key)	10	36	50	OE	Oil Filter (Remove filter element, clean housing, install new element) See note 3 — 40
Gear Housing Fill Plug (See Key)	OE 10	37	50	OE	Crankcase Breather (Clean and re-oil) (See Key) — 41
Gear Housing Level Plug (Check level)	10	38	10		Crankcase Oil Level Bayonet Gage (Check level) — 42
Gear Housing Drain Plug (Drain and refill)	250	39	50		Crankcase Drain Plug (Drain and refill) — 43



WISCONSIN MODEL MVF4D

3895-219/17 ④ .1 C2

Front

Figure 17 ④ .1—Continued.

– KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F	+40°F to −10°F	0°F to −65°F	
OE - Oil, Engine, Heavy Duty					
Crankcase	5 qts.	OE 30	OE 10	OES	Interval given are in hours of normal operation
Gear Housing	1 qt				
Air Cleaner	1 qt				
Oil Can Points					
OES - Oil, Engine, Subzero					

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW −10 F. Remove lubricants prescribed in the key for temperatures above 10 F. Relubricate with lubricants specified in the key for temperature below −10 F.

2. OIL CAN POINTS. Weekly clean and lightly coat the governor and carburetor linkage and joints with OE.

3. Oil Filter. After removing filter element, fill crankcase, operate engine 5 minutes, check housing for leaks, check crankcase level and bring to full mark.

4. LUBRICANTS. The following is a list of lubricants with the Military Symbols and applicable specification numbers.

OE-MIL-L-2104 OES-MIL-L-10295

Copy of this Lubrication Order will remain with the equipment at all times. Instructions contained herein are mandatory.

BY ORDER OF THE SECRETARY OF THE ARMY:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

OFFICIAL:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

FOLD FOLD

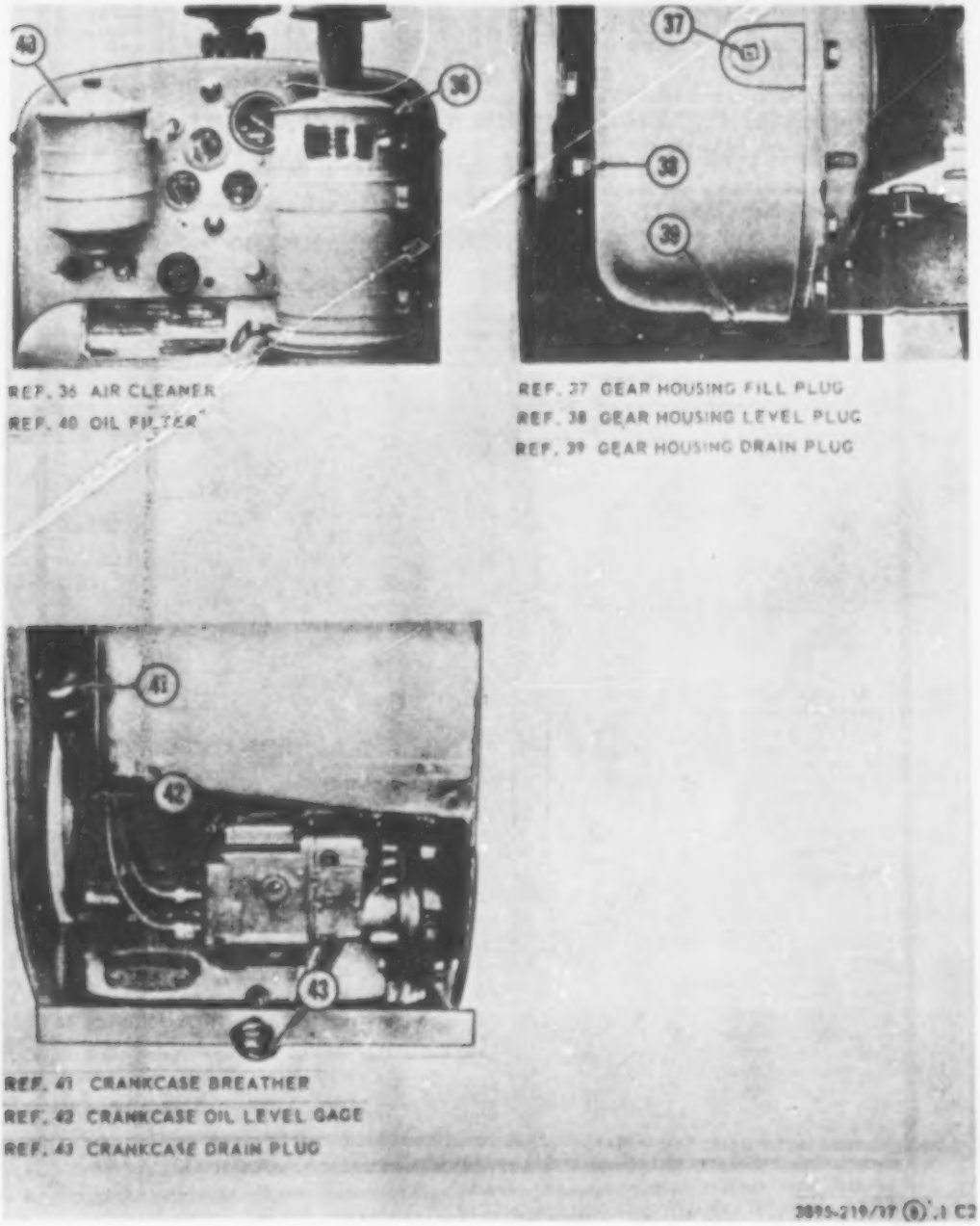
3895-219/17 ④ .2 C2

Rear

Figure 17④.2—Continued.

Page 29. (As changed by C 1, 21 Apr 67) In figure 17⑤, change callout number "15" to read "7".

Page 32, figure 17—Continued. Illustrations covering reference points 36 through 43 are added after "REF. 33 AIR CLEANER" as follows:



Reference points 36 through 43

Figure 17⑧ 1—Continued

Page 32. In paragraph 44*f*, line 2 the following is added after *"153609": and 18-4869 through 185154).*

Page 33. In paragraph 44*g*(1)*(f).* (As changed by C 1, 21 Apr 65) In line 7, "(10), fig. 6" is changed to read "(9), fig. 5)".

Page 34. In paragraph 44*h*, line 2 the following is added after "153609": *and 184869 through 185154)*

In paragraph 44*i*, line1, the following is added after *"Gage": (Serial No. Range 148883 Through 148982 and 153351 Through 153609).*

Page 36. In paragraph 44, the following is added after paragraph *k:*

l. Servicing Crankcase Breather and Oil Filler Cap (Serial No. Range 184869 Through 185154).

(1) Wipe any accumulated dirt or other foreign matter from the exterior of the crankcase breather [(7), fig. 6.1].

(2) Remove the breather and wash it in cleaning solvent, and dry thoroughly.

(3) Coat the breather holes with a light coat of engine oil and replace.

Page 38, figure 22. (As changed by C 1, 21 Apr. 65). In item number 11, line 1, "3/4 to 1 inch" is changed to read "1/2 to 3/4 inch ".

Page 39. In paragraph 52, the following is added to the paragraph title after "Overheats": (Serial No. Range 148883 Through 148982 and 153351 Through 153609).

The following is added after paragraph 52:

52.1. Engine Overheats (Serial No. Range 184869 Through 185154).

Probable cause	*Possible remedy*
Crankcase oil supply low	Stop engine and add oil to proper level.
Mixer overloaded	Reduce amount of batch.
Part of air shroud removed from engine. OR COOLING FINS ON CYLINDER CLOGGED WITH DIRT.	Report to proper authority (para 33*a*, *l*(1)).

Page 41. In paragraph 61, the following is added after *b*(12):

b.1. Fuel Filter and Pump (Serial No Range 184869 Through 185154. The fuel filter is adjacent to the fuel pump, which contains a fuel strainer. The fuel pump is to be serviced at the same time as the fuel filter.

(1) Close the fuel shutoff cock [(12), fig 24.1].

(2) Loosen the knurled nut (8) and, holding the glass sediment bowl (11) in place, swing the bail (7) to one side. Remove the bowl, strainer screen (10), and washer (9).

(3) Wash the bowl, screen and washer in approved cleaning solvent and dry thoroughly. Replace any damaged part.

(4) Position the washer and screen on the bowl. Install the assembled bowl, screen, and washer under the head of the fuel strainer, and secure them in place by swinging the bail beneath the bowl and tightening the knurled nut.

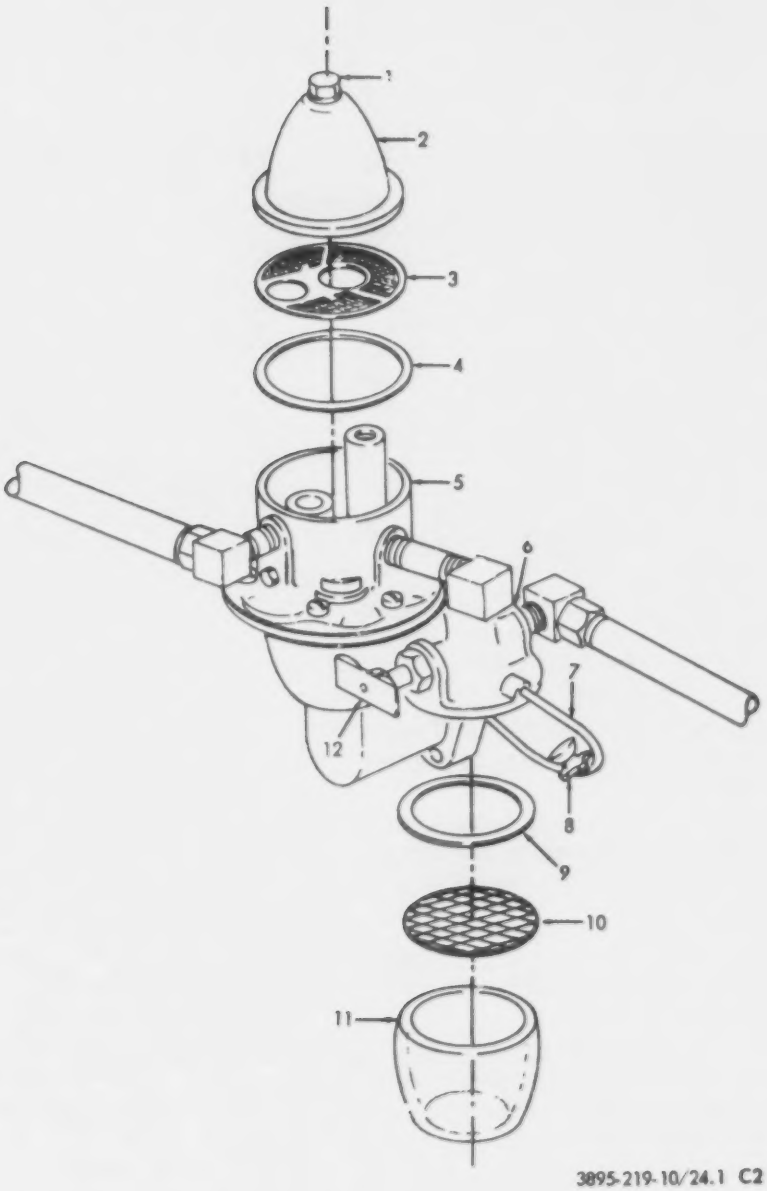
(5) Loosen the screw (1), fig 24.1)] and remove the cover (2) from the pump body (5). Remove the screen (3) and gasket (4).

(6) Wash the cover and screen in approved cleaning solvent and dry thoroughly. Replace any damaged part.

(7) Position the gasket (4), screen (3) and cover (2) on the pump body (5) and secure by installing screw (1).

(8) Make sure the fuel shutoff cock (12) is fully open.

Figure 24.1 is added as follows:



3895-219-10/24.1 C2

1	Screw (spec)	7	Bail
2	Cover	8	Knurled nut
3	Screen	9	Gasket
4	Gasket	10	Filter element
5	Pump body	11	Sediment bowl
6	Filter head	12	Shutoff valve

Figure 24.1. Fuel pump and fuel filter, exploded view (serial No. range 184869 through 185154).

In paragraph 61, the following is added below *e*(4):

f. Fuel Tank (Serial No. Range 184869 Through 185154). Drain the fuel tank to remove dirt, water, or other contaminates.

(1) Open the fuel draincock on the fuel tank [(12), fig 4.1], and provide a suitable container for the fuel to be drained into.

(2) Drain the entire fuel supply into the container provided.

(3) Close the draincock and fill the fuel tank (para 6).

In paragraph 62, the following is added after "System" in the paragraph title: (Serial No. Range 148883 Through 148982 and 153351 Through 153609).

In paragraph 63, the following is added after "V-Belt" in the paragraph title: (Serial No. Range 148883 Through 148982 and 153351 Through 153609).

Page 43 The following is added after paragraph 63*b*(4):

63.1. Generator Drive V-Belt (Serial No. Range 184869 Through 185154).

a. General. The engine generator is driven from the crankshaft pulley by a V-Belt. Correct belt tension must be maintained to keep the generator functioning properly.

b. Adjustment.

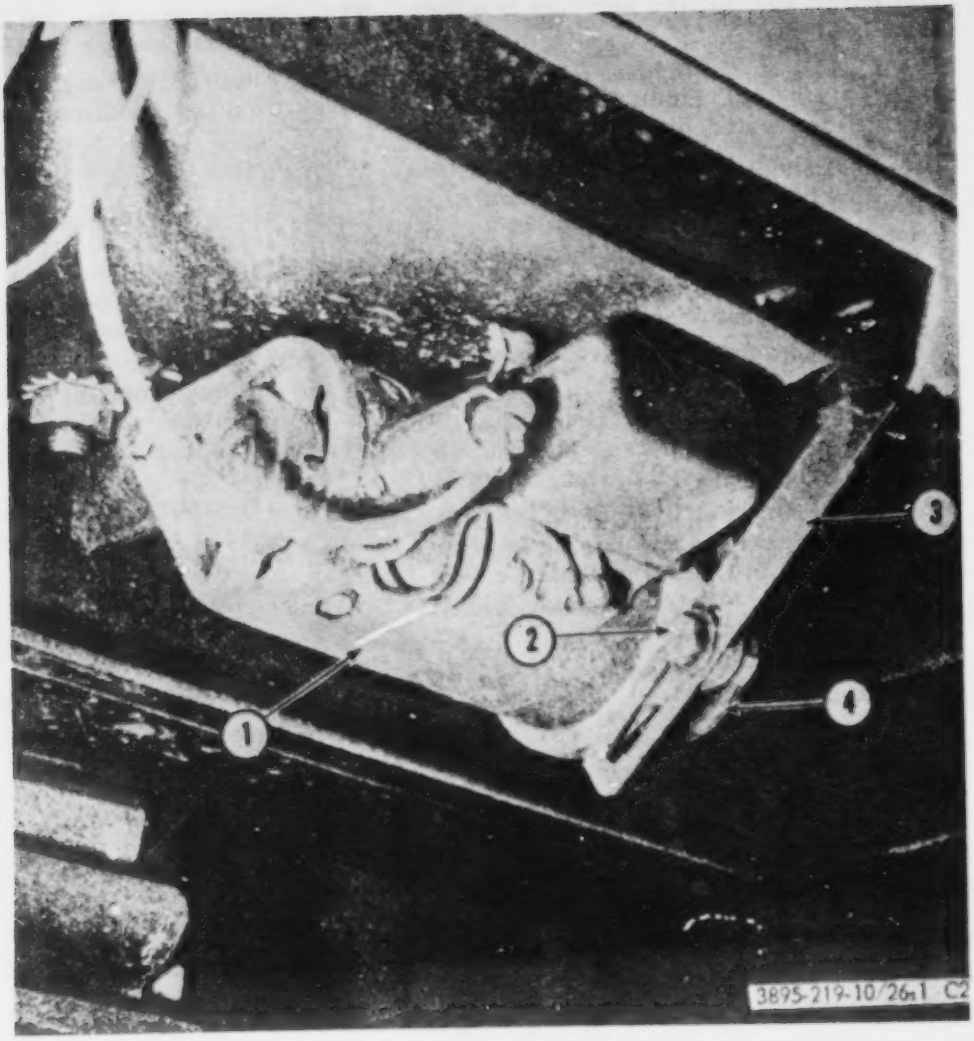
(1) Loosen the bolt (2), fig 26.1) that secures the generator (1) to the adjusting bracket (3).

(2) Move the generator downward away from the engine until the tension of the V-belt (15), fig 12.1), allows a deflection of 1/2 to 3/4 inch when pressed midway between the crankshaft pulley (14) and the generator pulley [(4), fig 26.1].

(3) Tighten the bolt (2) to secure the generator (1) to the adjusting bracket (3).

(4) Recheck the belt tension.

Figure 26.1 is added as follows:



1 Generator
2 Bolt
3 Adjusting strap
4 Generator drive pulley

Figure 26.1 Generator V belt adjustment (serial No range 184869 through 185154).

Page 44. The following is added after paragraph 65*c*(5):

65.1. Panel Light (Serial No. Range 184-869 Through 185154)

a. General. The panel lights [(3), fig 12.1)], controlled by an on—off switch (16), are equipped with a 28-volt, 1.7 ampere, 3-candlepower, bayonet-base type lamp, and a reflection shield.

b. Cleaning and Inspection. Refer to paragraph 65*b* above.

c. Lamp Replacement. Refer to paragraph 65*c* above.

Page 46, paragraph 71, (As deleted by CL, 21 Apr. 65). In lines 8 and 9 the following is deleted: "when available for carrying out destructions".

Page 47, Appendix I. In paragraph 3, the following is added below line 2:

LO 5-3895-219-20-1 LO 5-3895-219-20-2 LO 5-3895-219-20-3	Mixer, Concrete, Trailer Mounted; 16 Cu Ft (Construction Machinery Co. Model 16SM) W/Engine Continental Model YS116 (Serial No. Range 148883 through 153609) or Engine Wisconsin Model MVF-4D (Serial No. Range 184-869 through 185154).

Page 49. In paragraph 3, "14341" is changed to read "14351". In paragraph 3, the following is added: 66289—Wisconsin Motor Corp.

Page 50, section II, functional group 0114. In line 2, after "PY116-309", the following is added: (Serial No. Range 148883 through 148982 and 153351 through 153609). The following item is added to above index in indicated column. Source: X2; Maintenance; O; FSN: 2990-906-7920; Description: CRANK, HAND, ENGINE STARTING (66289) U212R (Serial No. Range 184869 through 185154); Quantity Authorized: 1; Quantity issued with equipment: 1.

Page 50, Section II, functional group 0612. (As changed by C 1, 21 Apr. 65) In item 1, line 2, "21" is changed to read "12". (As superseded by C 1, 21 Apr 65)

Section II, functional group 2605—PUBLICATIONS is superseded as follows;

Technical Service	*Description*	*Quantity Authorized*	*Quantity Issued With Equipment*
	2605 — PUBLICATIONS		
12	**DEPARTMENT OF THE ARMY LUBRICATION ORDER LO 5-3895-219-20-1, LO 5-3895-219-20-2, LO 5-3895-219-20-3**	**1**	**1**
12	**DEPARTMENT OF THE ARMY OPERATOR'S MAINTENANCE MANUAL TM 5-3895-219-10**	**1**	**1**
12	**DEPARTMENT OF THE ARMY ORGANIZATIONAL MAINTENANCE MANUAL TM 5-3895-219-20**	**1**	*****
12	**DEPARTMENT OF THE ARMY FIELD AND DEPOT MAINTENANCE MANUAL TM 5-3895-219-35**	**1**	*****

Technical Service	*Description*	*Quantity Authorized*	*Quantity Issued With Equipment*
12	DEPARTMENT OF THE ARMY ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOL LISTS TM 5-3895-219-20P	1	•
12	DEPARTMENT OF THE ARMY FIELD AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOL LISTS TM 5-3895-219-35P	1	•

Page 51, Appendix II, section II. The following item is added under functional group 7603 in indicated column. Source: PL; Maintenance: O; FSN 4210-881-0531; Description: EXTINGUISHER, FIRE, DRY CHEMICAL: class 8, type B-C, size 1 w Bracket (serial No. Range 184869 throu 185154); Quantity authorized: 1; quant issued with equipment: 1.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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USARTYBD (2)
USAARENBD (2)
USAIB (2)
USARADBD (2)
USAAESWBD (2)
USAAVNTBD (2)
USCONARC (3)
OS Maj Comd (5) except
  USASETAF (2)
  USARJ (1)
USAMC (1)
USAMECOM (46)
MDW (1)
Armies (2)
Corps (2)
Div (2)
Engr Bde (1)
Svc Colleges (2)
Br Svc Sch (2) except
  USAES (None)
USMA (2)
USACDCEC (10)
Gen Dep (10)
Engr Dep (10)
Army Dep (2) except
  TOAD (3)
EAMTMTS (2)
WAMTMTS (2)
MOTBA (1)
MOTBY (1)
MOTKI (1)
MOTSU (1)
Div Engr (2)
Engr Dist (2)
USA Mbl Equip R&D Cen (3)
Engr Cen (5)
USAREUR Engr Proc Cen (2)
USAREUR Engr Sup Con Agcy (10)
Engr FLDMS (2)
Ft Knox FLDMS (10)
Fld Comd, DASA (8)
AMS (3)
USACOMZEUR (2)
USAC (1)
MAAG (1)
JBUSMC (1)
USARMA (1)
USARMIS (1)
Units org under fol TOE:
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5-35	5-237 (5)
5-36	5-262 (5)
5-48	5-267 (1)
5-54	5-278 (5)
5-115	5-279
5-117	5-500 (EA,EB,HF,HG)
5-118	19-256
5-129	55-225
5-195	55-227
5-197	55-500 (EL)

NG: State AG (3).

USAR: Same as active Army except allowance is one copy for each unit.

For explanation of abbreviations used, see AR 320-50.

TECHNICAL MANUAL
No. 5-3895-219-10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *11 June 1963*

OPERATOR'S MANUAL

Mixer, Concrete, Trailer Mounted: Gasoline Driven; 16 Cu Ft (Construction Machinery Model 16SM) FSN 3895-807-7985

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*This manual supersedes TM 5-3895-219-10, 17 January 1961.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions are published for the use of the personnel to whom the Concrete Mixer, Construction Machinery Model 16SM, is issued. They provide information on the operation, lubrication, and preventive maintenance services of the equipment, accessories, components, and attachments.

b. Appendix I contains a list of publications applicable to this manual. Appendix II contains the list of basic issue items authorized for the operator of this equipment and of maintenance and operating supplies for initial operation. The maintenance allocation chart is located in the Organizational Maintenance Manual, TM 5–3895–219–20.

c. Report all deficiencies in this manual on DA Form 2028. Submit recommendations for changes, additions, or deletions to the Commanding Officer, U.S. Army Mobility Support Center, ATTN: SMOMS–MS, P. O. Box 119, Columbus 16, Ohio. Direct communication is authorized.

d. Report unsatisfactory equipment performance and suggestions for equipment improvement to the organizational unit for initiating necessary corrective action.

e. Report all equipment improvement recommendations as prescribed by TM 38–750.

2. Record and Report Forms

For record and report forms applicable to the operator, refer to TM 38–750.

Note. Applicable forms, excluding Standard Form 46 which is carried by the operator, will be kept in a canvas bag mounted on the equipment.

Section II. DESCRIPTION AND DATA

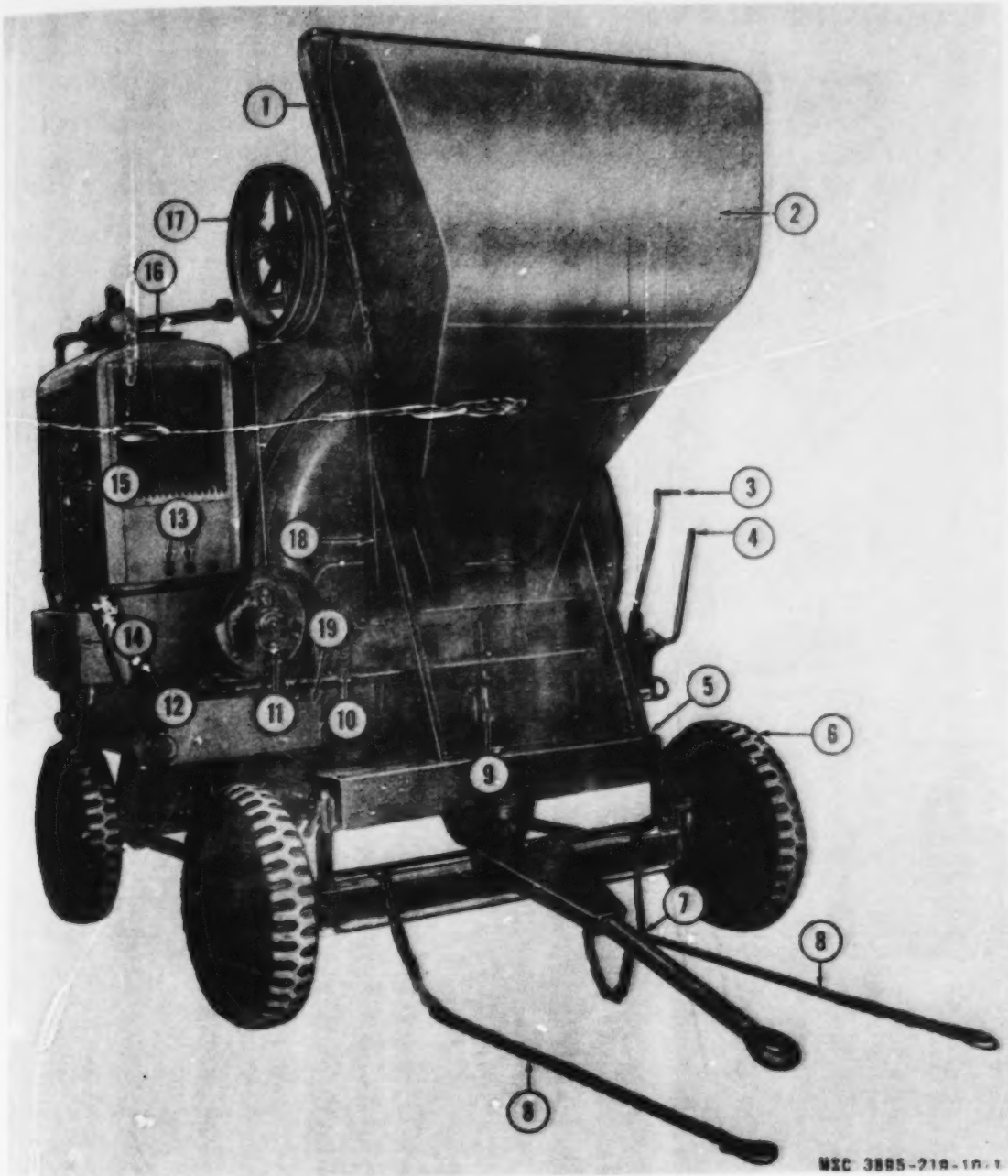
3. Description

a. General. The Construction Machinery Company Model 16SM Concrete Mixer is a self-contained, wheeled unit, portable by towing. Differences existing within this model, and designated by serial number ranges, are set forth in paragraphs 4 and 5 as well as other appropriate paragraphs. Since the general design and arrangement are identical in both serial number ranges, illustration callouts will, in the following description, be given only for figures 1 and 2 (serial No. range 148883 through 148982); reference to figures 3 and 4 will locate the same components of mixers in serial No. range 153351 through 153609.

b. Frames and Superstructure. The base of the mixer is the truck frame (5, fig. 1) which is mounted on 2 fixed track pneumatic tired wheels (6) at the rear and on 2 steerable pneumatic tired wheels at the front and is attached to a towing vehicle by the towing tongue (7). Mounted across the truck frame (5) are the main frame (19) and the superstructure (18), which in combination, support and contain the engine (15), loading skip (2), skip bumper (9), mixing drum (11, fig. 2), discharge chute (9), and all other operating parts.

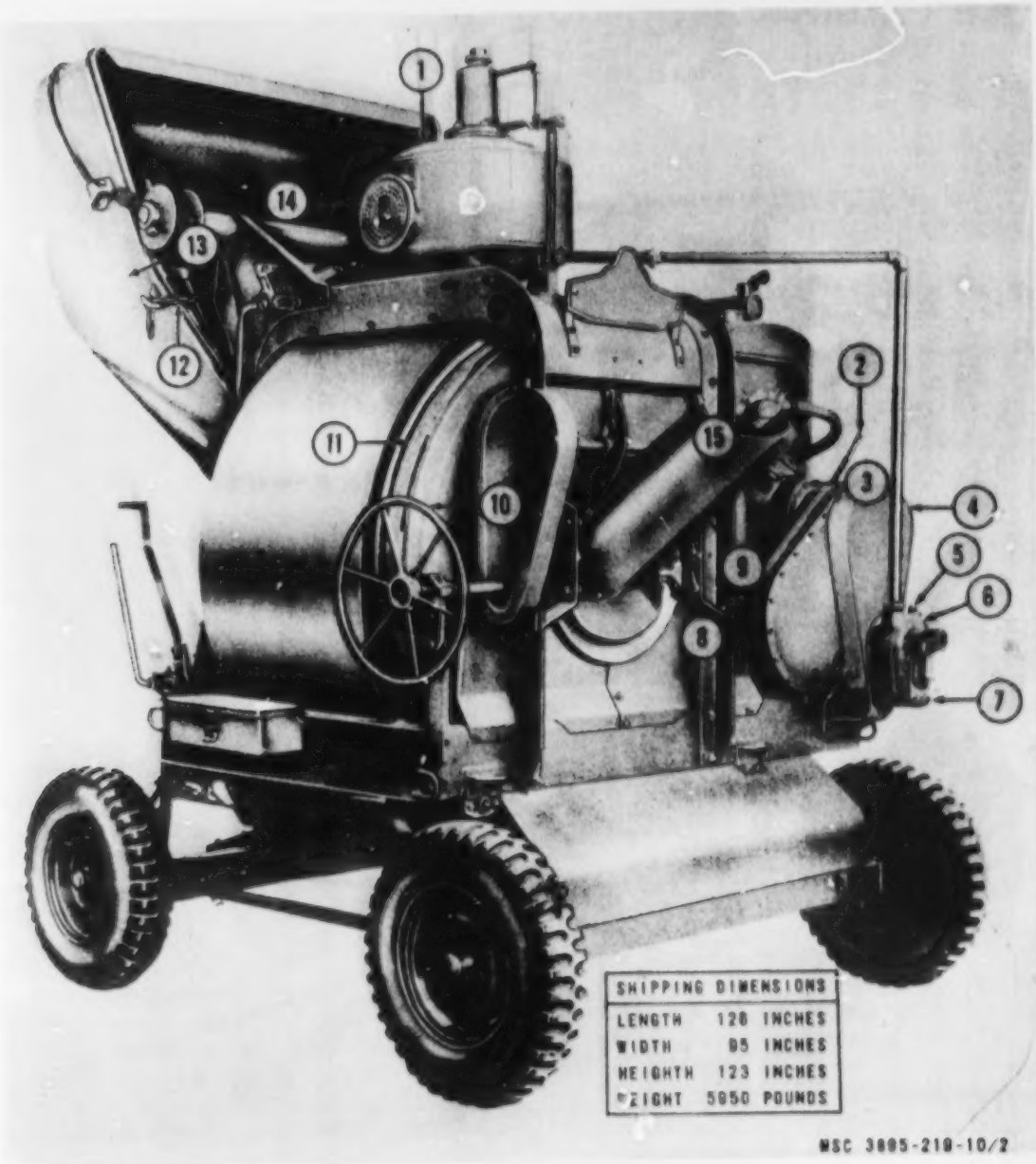
c. Operating Parts and Systems. Batch mixing is accomplished in the rotating mixing drum. Dry batch ingredients are power lifted by hoist cables into the mixing drum by the loading skip which is controlled by the skip clutch lever (3, fig. 1) and skip brake lever (4). A self-driven dual prime pump (6, fig. 2) delivers water to the water tank (1) from which it is metered by the water volume control (14) into the mixing drum; a pump drive belt guard (4) covers the drive belts. A manually-operated discharge chute (9) opens the discharge side of the mixing drum to direct the gravity fed discharge of the properly mixed batch. The power system of the mixer is so arranged that the loading system, the water system, and the discharge system will function only when the mixing drum is rotating.

d. Power System. Two models of Continental engines are used as the power source for the Model 16SM Cement Mixer. Figure 5 illus-



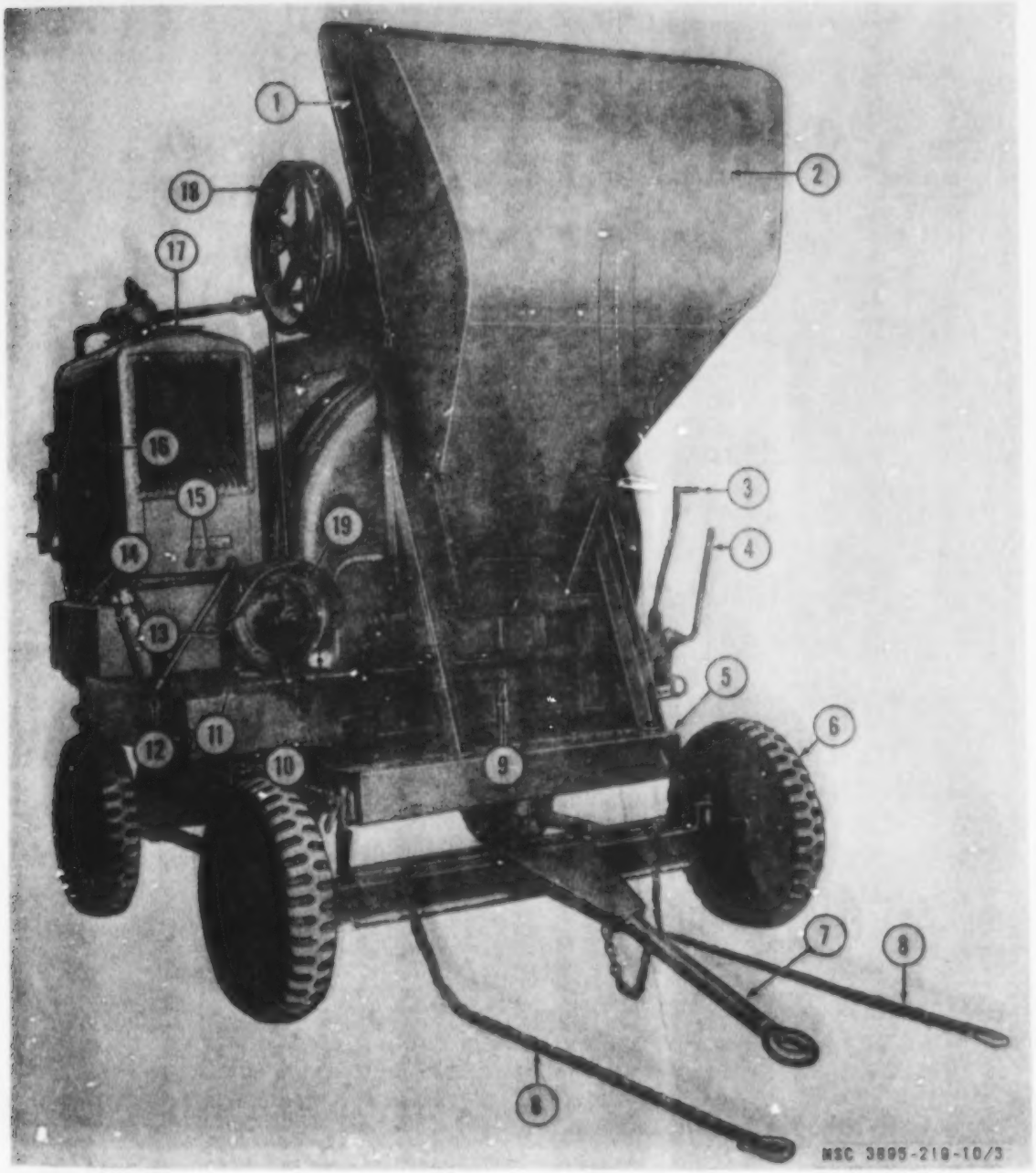
1	Skip hoist cable (2 rqr)	6	Pneumatic-tired wheel (4 rqr)	10	Skip clutch knockout arm	14	Battery box
2	Loading skip	7	Towing tongue	11	Skip clutch	15	Engine
3	Skip clutch lever	8	Towing safety chain (2 rqr)	12	Skip brake	16	Radiator hatch cover
4	Skip brake lever	9	Skip bumper	13	Cooling system drain plug (2 rqr)	17	Hoist cable pulley
5	Truck frame					18	Superstructure
						19	Main frame

Figure 1. Mixer, right front view (serial No. range 148883 through 148982).



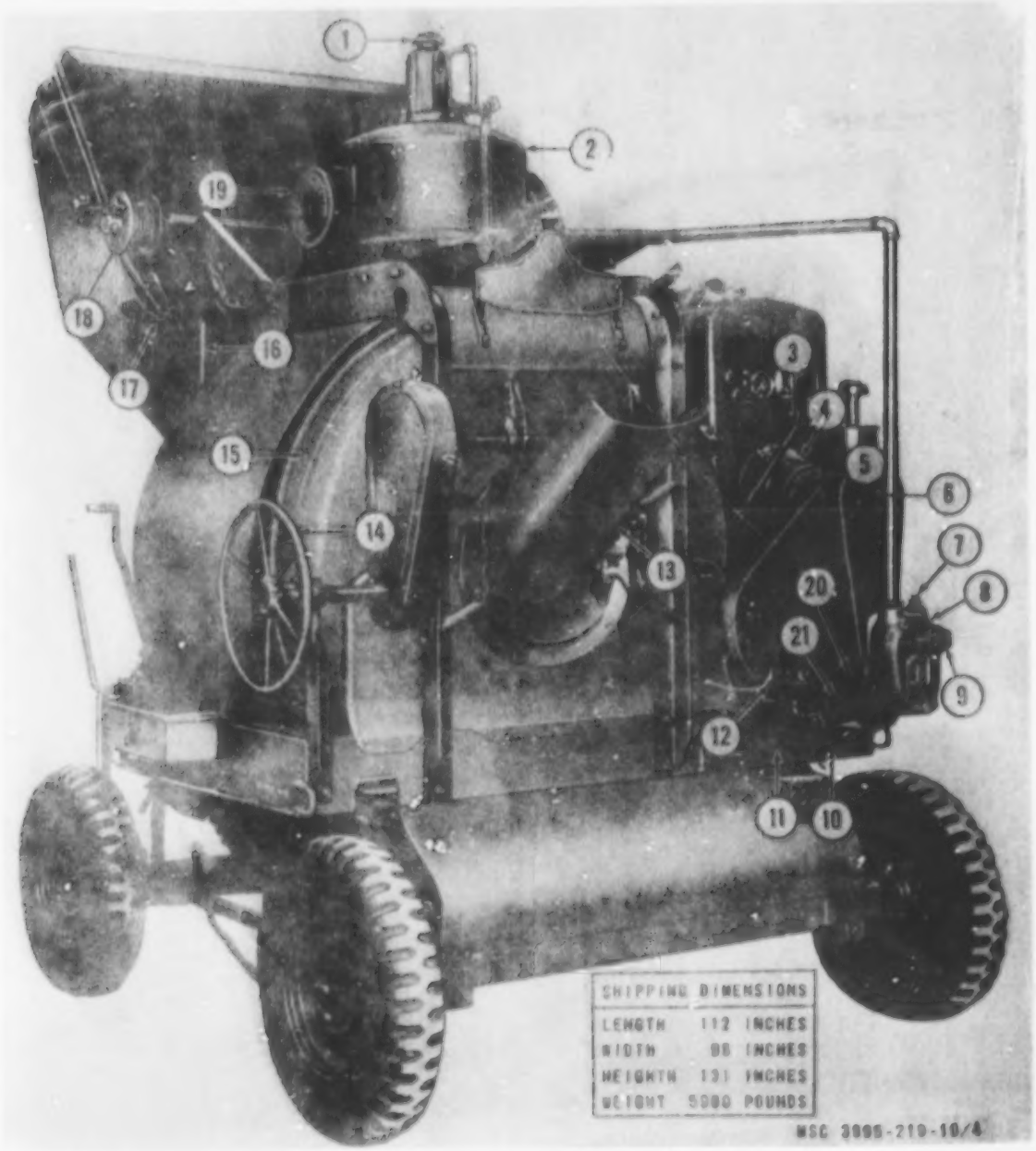
1 Water tank
2 Engine clutch lever
3 Power transfer gear assembly
4 Pump drive belt guard
5 Dual prime pump priming plug
6 Dual prime pump
7 Dual prime pump drain plug
8 Main drive assembly
9 Discharge chute
10 Discharge chute handwheel
11 Mixing drum
12 Loading skip safety chain (2 rqr)
13 Loading skip
14 Water volume control
15 Engine clutch

Figure 2. Mixer, left rear view and shipping dimensions (serial No. range 148883 through 148982).



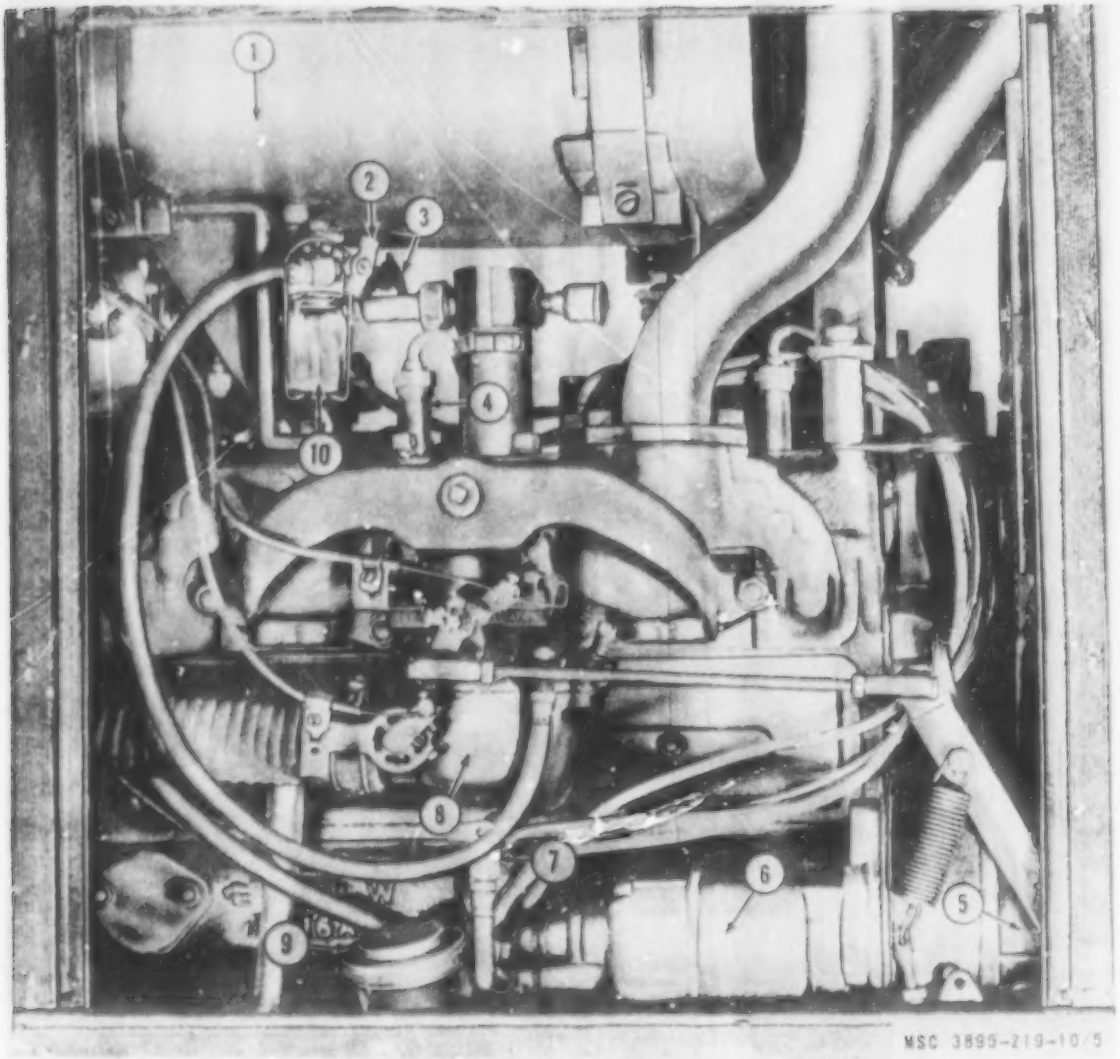
1 Skip hoist cable (2 rqr)
2 Loading skip
3 Skip clutch lever
4 Skip brake lever
5 Truck frame
6 Pneumatic-tired wheel (4 rqr)
7 Towing tongue
8 Towing safety chain (2 rqr)
9 Skip bumper
10 Skip brake spring
11 Brake spring eyebolt
12 Crankcase drain plug
13 Skip brake
14 Battery box
15 Cooling system drain plug (2 rqr)
16 Engine
17 Radiator hatch cover
18 Hoist cable pulley
19 Skip clutch

Figure 3. Mixer, right front view (serial No. range 153351 through 153609).



1 Water tank air valve
2 Water tank
3 Engine clutch lever
4 Engine clutch
5 Power transfer gear assembly
6 Pump drive belt guard
7 Dual prime pump priming plug
8 Dual prime pump
9 2-inch input port
10 Pump mounting nut (spec) (4 rqr)
11 Main frame
12 Main drive assembly
13 iDscharge chute
14 Discharge chute handwheel
15 Mixing drum
16 Water valve control
17 Skip safety chain (2 rqr)
18 Skip cable spool
19 Water volume control
20 Belt guard support (3 rqr)
21 Pump bracket

Figure 4. Mixer, left rear view and shipping dimensions (serial No. range 153351 through 153609).



1 Fuel tank
2 Fuel tank shutoff valve
3 Fuel tank draincock
4 Spark plug (4 rqr)
5 Governor
6 Magneto
7 Carburetor draincock
8 Carburetor
9 Oil filler cap and gage
10 Fuel filter

Figure 5. Engine model YS 116-6007, right side view (serial No. range 148883 through 148982).

trates the Continental Model YS 116-6007 engine used with mixers in serial No. range 148883 through 148982. Figure 6 illustrates the Continental Model YS 116-6011P engine used with mixers in serial No. range 153351 through 153609. Each engine is a four-cylinder, four-cycle, liquid cooled engine equipped with an electric starter, magneto (6, fig. 5), and governor (5); in both engines the carburetor (8) provides correct fuel-air ratio for all speeds and loads. In addition to these parts (which can also be identified in fig. 6), the Model YS 116-6011P engine incorporates a fuel strainer and shutoff valve (3, fig. 6), an auxiliary fuel inlet plug (8), battery charging receptacle connector (9), a fuel pump (13), a three-way fuel valve (16), and an auxiliary fuel shutoff valve (15). On both engine models power is transfered to the main drive assembly (8, fig. 2) through a disk type clutch (15) incorporated

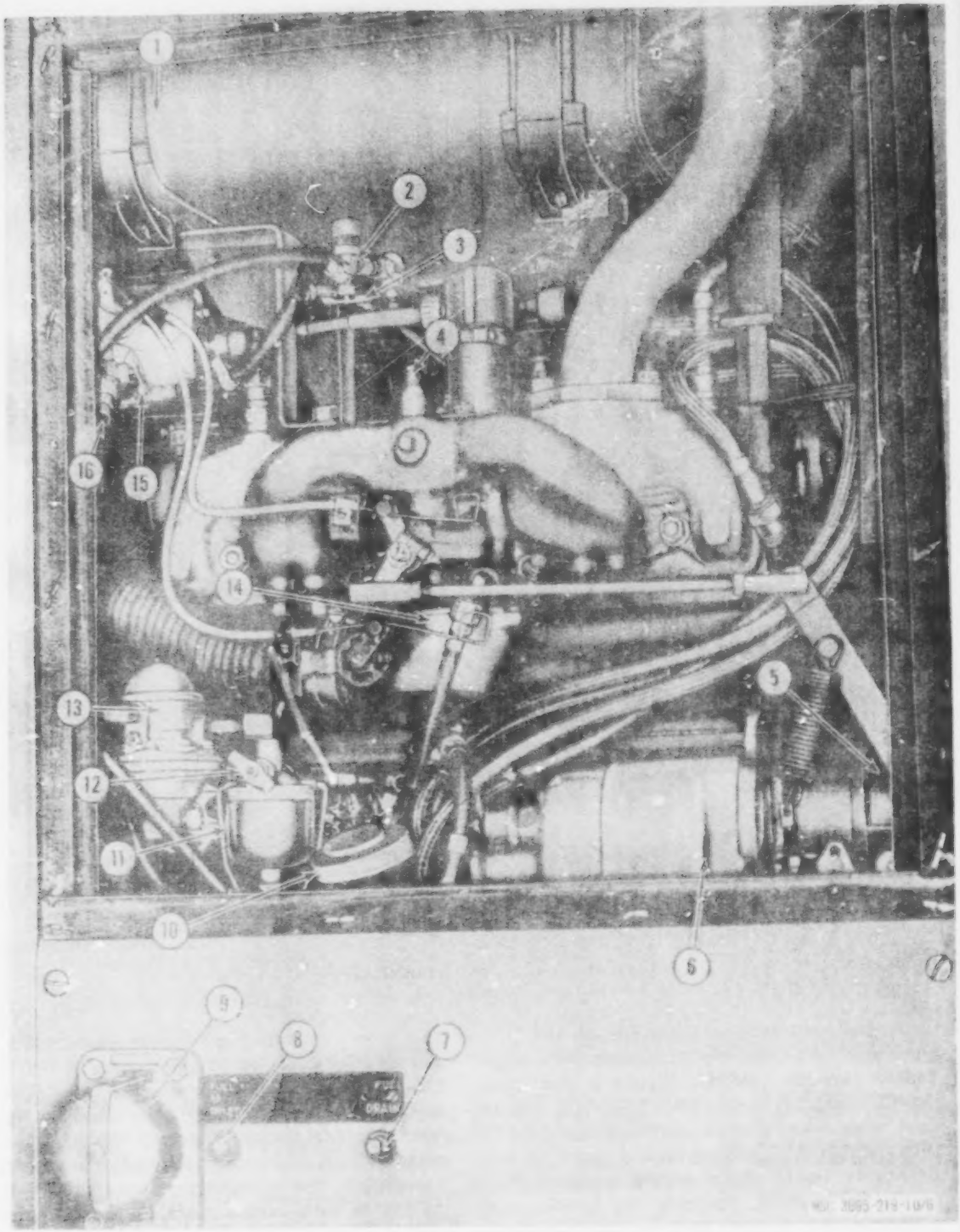


Figure 5 Engine, model YS 116-6011P, right side view (serial No. range 155351 through 1536091).

1 Fuel tank
2 Fuel tank draincock
3 Fuel strainer and shutoff valve
4 Spark plug (4 rqr)
5 Governor
6 Magneto
7 Fuel drain plug
8 Auxiliary fuel inlet plug
9 Battery charging receptacle connector
10 Oil filler cap and level gage
11 Fuel filter
12 Fuel filter shutoff valve
13 Fuel pump
14 Carburetor
15 Auxiliary fuel shutoff valve
16 Three-way fuel valve

Figure 6—Continued.

in a power transfer gear assembly (3). The clutch is engaged and disengaged by the engine clutch lever (2).

4. Identification and Tabulated Data

a. Identification. The mixer has three identification plates. The Corps of Engineers identification plate is located on the left mixing drum guard. The two engine manufacturer's data plates are mounted on the left side of the engine cylinder block.

b. Tabulated Data.

(1) *Corps of Engineers data plate A, (serial No. range 148883 through 148982).*

Nomenclature	Mixer, Concrete, Flr Mtd, G.E.D. Nontilting, 16 cu ft, End, Disch
Stock No.	3895-807-7985.
Serial No.	
Registration No.	
Manufacturer	CMC
Model	16SM
Cont. No.	88B46 409-32
Date Manufactured	
Length	126
Width	95
Height	123
Capacity or pay load	16 cu ft
G.V.W.	
Shipping weight	5950
Cube	864.8 ft
Engine Manufacturer	Continental Motor Corp.
Model	YS116-6007
Engine Serial No.	

(2) *Corps of Engineers data plate A, (serial No. range 148883 through 153609).*

Nomenclature	Mixer, Concrete, Flr Mtd., G.E.D. Nontilting, 16 cu. ft., End, Disch
Stock No.	3895-807-7985
Serial No.	
Registration No.	
Manufacturer	Const. Machy Co.
Model	16SM
Control No.	88B48341-32
Date manufactured	
Length	112
Width	96
Height	131
Capacity or pay load	16 cu ft
G.V.W.	
Shipping Weight	5980
Cube	815
Engine Manufacturer	Continental Motors Corp.
Engine Serial No.	
Model	YS116-6011P

(3) *Engine manufacturer's data plate (serial No. range 153351 through 148982).*

Manufacturer	Continental Motors Corp.
Model	YS116
Spec.	6007
Engine No.	

(4) *Engine manufacturer's data plate (serial No. range 153351 through 153609).*

Manufacturer	Continental Motors Corp.
Model	YS116
Spec.	6011P
Engine No.	

(5) *Engine manufacturer's data plate (serial No. range 148883 through 148982).*

Type of engine	4 cycle—Gasoline
Rated horse power	21.3
At full-load speed (RPM)	2200
Date of manufacture	

(6) *Engine manufacturer's data plate (serial No. range 153351 through 153609).*

Type of engine	4 cycle—Gasoline
Rated horsepower	21.3
At full-load speed (RPM)	2200
Date of manufacture	

(7) *Mixer.*

Manufacturer	Construction Machinery Co.
Model	16SM.
Type	Trailer Mounted, end discharge 16 cu ft (cubic feet) ± 10% when operated on level.
Mixing capacity	

(8) *Engine (serial No. range 148883 through 148982).*

Manufacturer	Continental Motors Corp.
Model	YS116-6007

(9) *Engine (serial No. range 153351 through 155609).*

Manufacturer	Continental Motors Corp.
Model	YS116-6011P

(10) *Capacities.*

Fuel tank	7 gal (gallon)
Engine crankcase	4 qt (quart)
Air cleaner (serial No. range 148883 through 148982).	½ qt
Air cleaner (serial No. range 153351 through 153609).	1 qt
Cooling system	7 qt
Power transfer gear housing.	1 qt
Chain guard cover	⅜ qt
Oil filter	1 qt

(11) *Fuel consumption.*

Rate in gph (gallons per hour).	2.44 at 2200 rpm (revolution per minute)

(12) *Tire inflation.*

Front	45 psi (pounds per square inch)
Rear	45 psi

(13) *Batteries.*

Quantity	2
Type	Heavy duty
Rating	45 amp (amperes)
Voltage per battery	12 v (volts
Unit polarity	Negative ground

(14) *Adjustment data.*

Fan V-belt	½ to ¾ in. (inch) at midpoint

(15) *Dimensions and weight (serial No. range 148883 through 148982).*

Overall length	126 in.
Overall height	123 in.
Overall width	95 in.
Shipping weight	5,950 lb

(16) *Dimensions and weight (serial No. range 153351 through 153609).*

Overall length	112 in.
Overall height	131 in.
Overall width	96 in.
Shipping weight	5,980 lb

5. Differences in Models

This manual covers the Construction Machinery Company Model 16SM, Concrete Mixer, serial No. 148883 through 148982, and serial No. range 153351 through 153609. Differences existing within this model concrete mixer are due primarily to the difference in engines used in these two different serial number ranges. The variation in the engines is also reflected in the control panel. Specific differences, designated by serial number range, are set forth in appropriate paragraphs throughout this manual. Illustrations, if not specifically noted, are of mixers in serial No. range 148883 through 148982, and the components shown are approximately identical in both serial number ranges.

CHAPTER 2

INSTALLATION AND OPERATION INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

6. Inspecting and Servicing Equipment

Note. Make sure the mixer is completely depreserved before servicing. Make sure preservatives have been removed from the crankcase, fuel tank, filters, and the like.

a. Perform the daily preventive maintenance services (par. 46).

b. Lubricate the mixer in accordance with the current lubrication order (par. 43).

c. Inspect to see that the required tools, publications, accessories, and components are with the mixer.

d. Inspect the mixer for loose or missing parts or damage which may have occurred during loading, shipment, or unloading. Report all damage and deficiencies to organizational maintenance.

e. See that the cooling system drain plugs (13, fig. 1) are tight. Remove the radiator cap located under the hatch cover (16) and fill the cooling system with clean, fresh water. When freezing temperatures are expected, be sure the cooling system contains the proper antifreeze mixture. If the cooling system contains antifreeze and the level is low, report the condition to organizational maintenance.

f. Refer to appendix II and fill the fuel tank (1, figs. 5 and 6) with the proper grade of fuel.

Warning: **When filling the fuel tank, do not smoke or use an open flame in the immediate vicinity. Always provide metal-to-metal contact between the container and the fuel tank. This will prevent a spark being generated as fuel flows over metal surfaces. Failure to observe this warning may result in death to personnel.**

g. Be sure to electrolyte level in the batteries (11, fig. 7) is approximately three-eighths inch above the plates. If the level is low, add distilled water. See that the batteries are fully charged. Refer to TM 9–6140–200–15. If the batteries are received dry, report the condition to Organizational Maintenance.

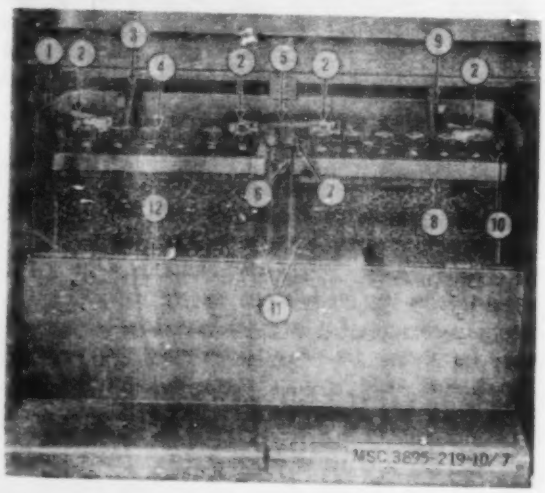
Warning: **Do not smoke or use an open flame in the vicinity when servicing the batteries. When charging or discharging batteries generate hydrogen, a highly explosive gas. Failure to observe this warning may result in death to personnel.**

h. Connect the water supply to the mixer as directed in paragraph 7 and flush the mixer water system with clear water. Rotate the mixing drum (1, fig. 8) until the drain plug (2) is on the bottom of the drum. Remove the plug and drain any water from the drum. Reinstall the plug.

i. Clean all dirt and grease from the mixer with an approved cleaning solvent and wipe dry.

7. Installation or Settingup Instructions

a. General. Locate the mixer convenient to the source of batch material and the area where the concrete will be used. Allow ample working space around the loading skip (2, fig. 1) and discharge chute (9, fig. 2). Where water from a pressure system is not available, run a hose



1 Battery box
2 Quick disconnector (4 rqr)
3 Solenoid cable (positive)
4 Filler cap (12 rqr)
5 Jumper cable
6 Holddown rod (4 rqr)
7 Nut, ⅜–24 (12 rqr)
8 Holddown (2 rqr)
9 Ground lead (negative)
10 Washer, flat, ⅜ in. (4 rqr)
11 Battery (2 rqr)
12 Battery box door

Figure 7. Batteries, installed view.

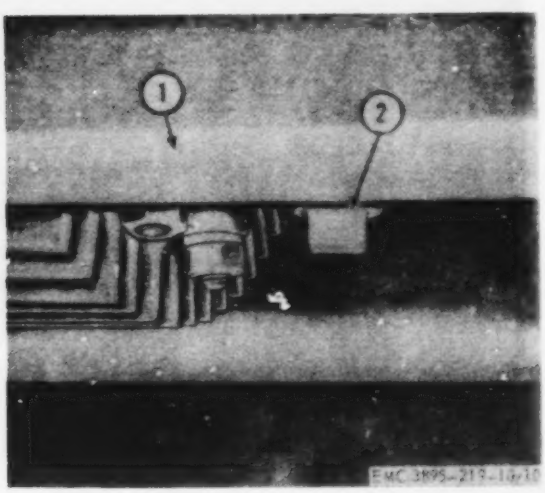
from the source of water to the dual prime pump (6). Place the mixer in a level position and aline the front wheels in a straight position; block all wheels at the front and back to prevent movement, and where the earth is soft, place wide planks under all wheels.

Caution: **A nonpressurized water source should be no further than 50 feet from the dual prime pump and its surface should be level with, or higher than the ground on which the concrete mixer is located.**

b. Stabilizer Setting. The mixer is equipped with two stabilizers (4, fig. 9), located over the front axle (7) on either side of the truck frame (6). Before operating the mixer, loosen the clamp (2), lower the stabilizer until it rests firmly against, and vertical to, the front axle, and tighten the clamp on the bolt (1). Set the other stabilizer in the same manner.

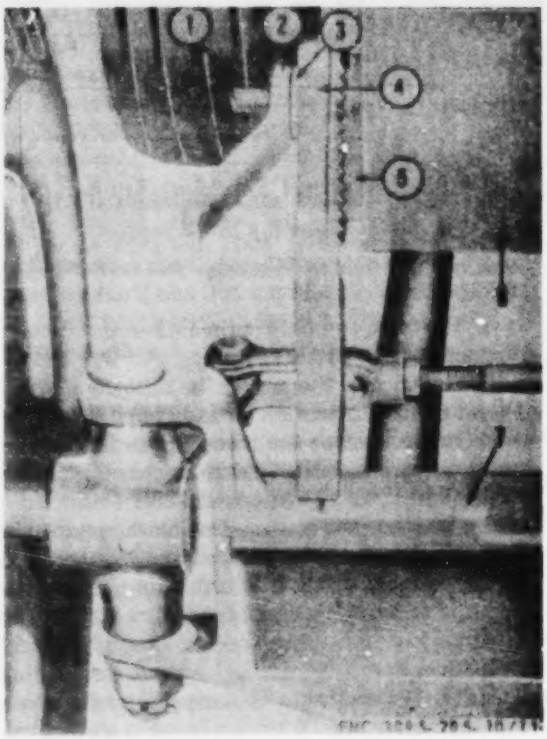
c. Towing Tongue Removal. The towing tongue (2, fig. 10) must be removed to allow the loading skip to function properly. Remove the cotter key (3), and clevis pin (4). Remove the towing tongue.

d. Water Supply Connection. The water supply to the mixer must be connected to the dual prime pump (8, fig. 4). Remove the plug from the 2-inch input port (9) of the dual prime pump and use pipe or hose and necessary fittings to connect the water supply to it. Check all connections for leaks.



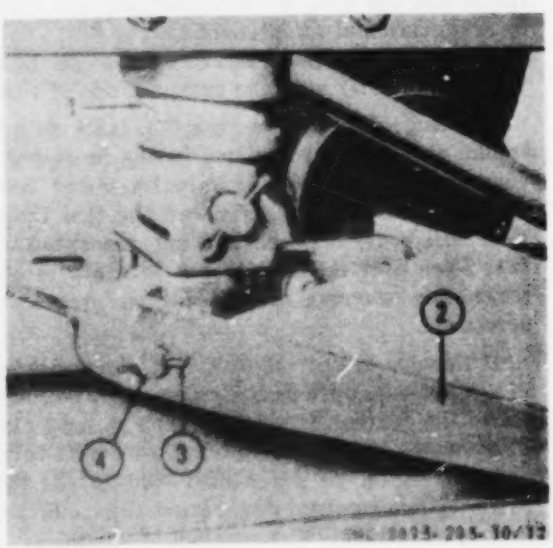
1 Mixing drum 2 Drain plug

Figure 8. Mixing drum drain plug.



1 Bolt
2 Clamp (2 rqr)
3 Washer
4 Stabilizer (2 rqr)
5 Stabilizer plate
6 Truck frame
7 Front axle

Figure 9. Stabilizers, installed view.



1 Front axle kingpin casting
2 Towing tongue
3 Cotter key
4 Clevis pin

Figure 10. Towing tongue, removal points.

e. Dual Prime Pump. The dual prime pump (8, fig. 4) is operated only when the pressure of the water supply is insufficient to raise the water to the level of the water tank (2); at other times the pump is disconnected.

(1) *To disconnect the dual prime pump.*
- (*a*) Fully loosen four pump mounting nuts (10).
- (*b*) Remove three screws and remove the pump belt guard (6) from the three belt guard supports (20).
- (*c*) Raise the pump bracket (21) and remove the two drive belts from the drive pulley at the power transfer gear assembly (5). Secure the drive belts to the pump bearing housing on the engine side of the pump.
- (d) Tighten the four pump mounting nuts (10). Position the pump belt guard (6) and install three screws to secure it to the three belt guard supports (20).

(2) *To connect dual prime pump and adjust drive belt tension.*
- (*a*) Repeat steps (*a*) and (*b*) of *e*(1) above.
- (*b*) Raise the pump bracket (21, fig. 4) and install the two drive belts on the drive pulley at the power transfer gear assembly (5).
- (*c*) Raise or lower the pump bracket so that the total deflection of the drive belts midway between the pulleys is ¾ to 1 inch. Tighten the four pump mounting nuts (10).
- (*d*) Position the pump belt guard (6) and install 3 screws to secure it to the three belt guard supports (20).

(3) *To prime dual prime pump.*
- (*a*) Make certain the dual prime pump is connected.
- (*b*) Make certain the water supply is connected.
- (*c*) Remove the priming plug (7, fig. 4) and fill the dual prime pump (8) with water.
- (*d*) Replace the priming plug and tighten in place.

f. Auxiliary Fuel Line, (Serial No. Range 153351 Through 153609). If an auxiliary fuel source is to be used remove the auxiliary fuel inlet plug (8, fig. 6), and connect the auxiliary fuel line to the inlet fuel connection.

8. Movement to a New Worksite

a. Preparation for Movement, (Serial No. Range 148883 Through 148982).

(1) Stop the mixer as directed in paragraph 31 with the skip (13, fig.2) in the raised position.

(2) Secure the two skip safety chains (12).

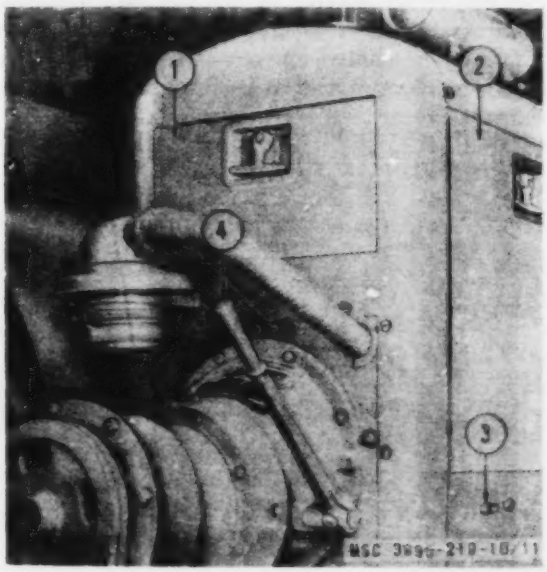
(3) Remove the engine side door (2, fig 11) and remove the fuel drain plug (3).

(4) Open the fuel tank and carburetor draincocks (3 and 7, fig. 5) and drain all the fuel into a suitable container. Close both draincocks.

(5) Install the fuel drain plug and engine side door.

(6) Disconnect the water supply from the dual prime pump (6, fig. 2). Install the plug in the pump input port.

(7) Loosen the stabilizer clamps (2, fig. 9) and raise the stabilizers (4). Tighten the clamps.



1 Control panel door
2 Engine side door (2 rqr)
3 Fuel drain plug
4 Clutch lever

Figure 11. Engine doors and clutch lever (serial No. range 148883 through 148982).

(8) Install the towing tongue (2, fig. 10) and clevis pin (4) and secure with the cotter key (3).

b. Preparation for Movement, (Serial No. Range 153351 Through 153609).

(1) Perform *a*(1) and *a*(2) above.

(2) Disconnect auxiliary fuel line at the fuel inlet connection, and install the plug (8, fig. 6).

(3) Remove the engine side door (2, fig. 11), and remove the fuel drain plug (7, fig. 6).

(4) Open the fuel tank draincock (2), and drain the fuel into a suitable container. Close the draincock.

(5) Perform *a*(5) through *a*(8) above.

c. Towing. Attach the towing tongue (7, fig. 3) and safety chains (8) to the towing vehicle. Tow the mixer to the new location. Maximum towing speed is 15 mph. The operator of the towing vehicle must remember that the mixer is not equipped with wheel brakes, and that towing speed should be governed by prevailing traffic, weather, and road conditions.

***Caution:* Make sure the towing tongue and safety chains are securely fastened when the mixer is being towed.**

d. Reinstallation. Disconnect the towing tongue and safety chains from the towing vehicle and follow the installation or settingup instructions set forth in paragraph 7.

Section II. CONTROLS AND INSTRUMENTS

9. General

This section describes, locates, illustrates, and furnishes the operator or crew sufficient information about the various controls and instruments for proper operation of the mixer.

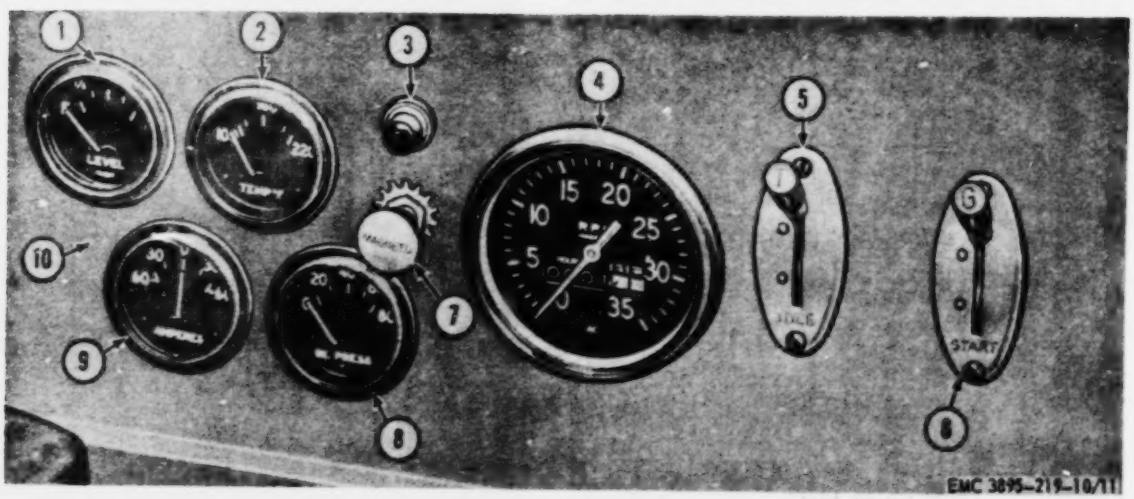
10. Choke Control

The choke control (6, fig. 12) is a vertically adjustable lever located on the control panel (10). The choke control operates the carburetor choke valve and is used when starting the engine. It has a START and a RUN position.

Note. All control panel components found on mixers in serial No. range 148883 through 148982 (fig. 12) will also be found on mixers in serial No. range 153351 through 153609. Refer to figure 13 for illustration of these common control components on mixers in the latter serial number range.

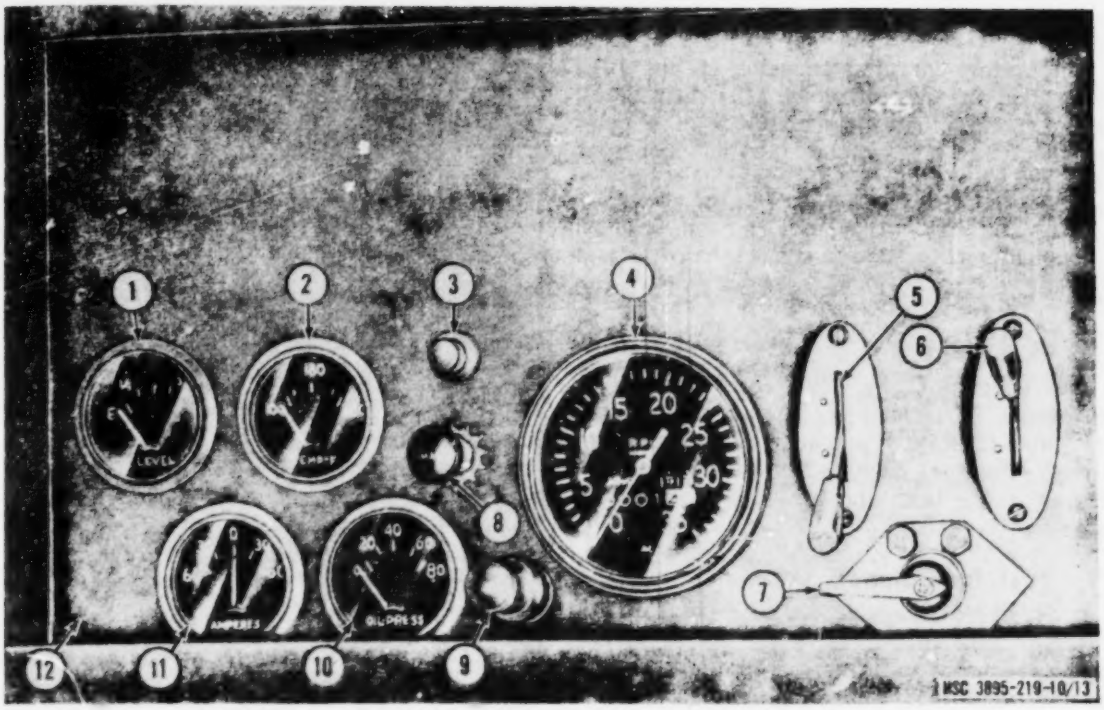
11. Throttle Control

The throttle control (5, fig. 12) is a vertically adjustable lever located on the control panel (10). The throttle control is connected to the



1 Fuel gage
2 Coolant temperature gage
3 Starter switch
4 Tachometer and time totalizing meter
5 Throttle control
6 Choke control
7 Magneto switch
8. Oil pressure gage
9 Battery-charging ammeter
10 Control panel

Figure 12. Control panel (serial No. range 148883 through 148982).



1 Fuel gage
2 Coolant temperature gage
3 Starter switch
4 Tachometer and time totalizing meter
5 Throttle control
6 Choke control
7 Three-way fuel valve
8 Magneto switch
9 Panel light
10 Oil pressure gage
11 Battery-charging ammeter
12 Control panel

Figure 13. Control panel (serial No. range 153351 through 153609).

carburetor and is used, together with the governor, to control the engine speed. It has an IDLE and a RUN position.

12. Magneto Switch

The magneto switch (7, fig. 12) is a push-pull type switch located on the control panel (10). Pushing the switch inward turns on the ignition.

13. Starter Switch

The starter switch (3, fig. 12) is a spring-loaded pushbutton type switch located on the control panel (10). Depressing the switch actuates the electric starting motor.

14. Tachometer and Time Totalizing Meter

The tachometer and time totalizing meter (4, fig. 12), located on the control panel (10), is a combination engine speed indicator and engine operating time recorder. The tachometer is a needle indicating gage, graduated from 0 to 35 in increments of 100 rpm. The time totalizing meter is a tumbler-wheel instrument which totals engine operating time in hours, tenths of hours, and hundredths of hours.

15. Oil Pressure Gage

The oil pressure gage (8, fig. 12) is located on the control panel (10). It is a needle indicating gage calibrated in pounds per square inch of pressure in increments from 0 to 80 pounds. It indicates the engine oil pressure. Normal operating pressure is 20 to 30 psi.

16. Coolant Temperature Gage

The coolant temperature gage (2, fig. 12), located on the control panel (10), is a needle indicating gage with a calibrated scale of 100° to 220° F. Normal operating temperature is 160° to 180° F. The danger zone is 200° to 220° F.

17. Battery-Charging Ammeter

The battery-charging ammeter (9, fig. 12), located on the control panel (10), is a zero-center, needle indicating meter with a calibrated scale of 0 to −60 and 0 to +60 amperes. The ammeter indicates the current flowing into or out of the batteries. During normal operation with fully charged batteries the ammeter should indicate a slight charge on the 0 to 60 scale.

18. Fuel Gage

The fuel gage (1, fig. 12), located on the control panel (10), is a needle indicating gage graduated in units of one-quarter fuel tank capacity. The fuel gage indicates the quantity of fuel in the tank and provides a guide for refueling.

19. Fuel Tank Shutoff Valve

a. Serial No. Range 148883 Through 148982. The fuel tank shutoff valve (2, fig. 5) is integrally mounted with the fuel filter (9) below the fuel tank (1). Turned fully clockwise, it shuts off fuel to the carburetor.

b. Serial No. Range 153351 Through 153609. The fuel strainer and shutoff valve (3, fig. 6) is mounted in the bottom of the fuel tank (1). Turned fully clockwise, it shuts off fuel to the fuel pump (13).

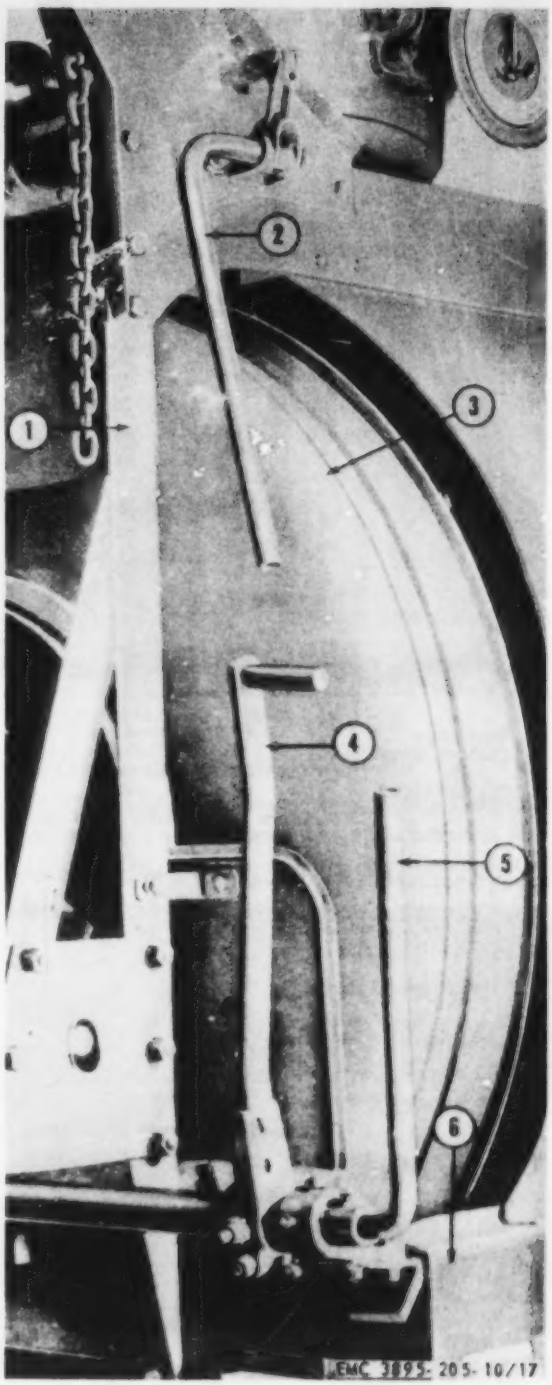
20. Three-Way Fuel Valve (Serial No. Range 153351 Through 153609 Only)

The three-way fuel valve (7, fig. 13) is located on the control panel (12). The fuel valve is used to select fuel from either the fuel tank or an auxiliary fuel source. In the OFF position it shuts off fuel from either source. Refer to paragraph 21.

Note. The three-way fuel valve (par. 20) and the auxiliary fuel shutoff valve (par. 21) are functionally interdependent. Any adjustment in the setting of one requires an adjustment in setting of the other. See paragraph 21.

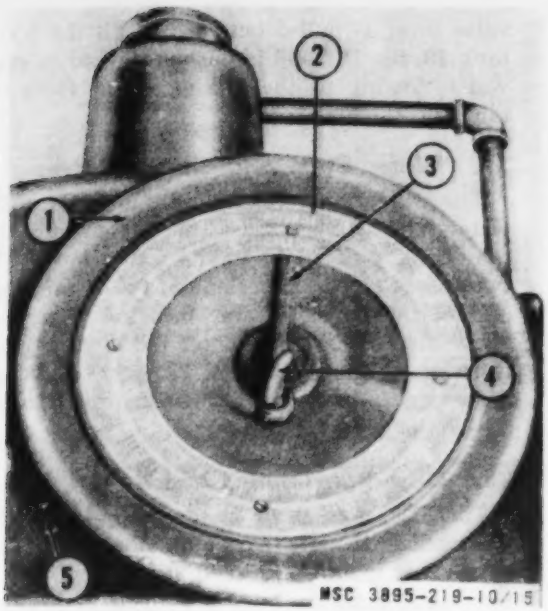
21. Auxiliary Fuel Shutoff Valve (Serial No. Range 153351 Throught 153609 Only).

The auxiliary fuel shutoff valve (15, fig. 6) is mounted on the auxiliary fuel inlet of the three-way fuel valve (16). When an auxiliary fuel supply is connected to the fuel inlet plug (8), and the three-way fuel valve (7, fig. 13)



1 Mixer superstructure
2 Water valve lever
3 Mixing drum
4 Skip clutch lever
5 Skip brake lever
6 Main frame

Figure 14. Water valve, skip clutch, and skip brake lever.



1 Cam wheel
2 Calibrated dial
3 Dial shaft with pointer
4 Thumbscrew
5 Water tank

Figure 15. Water volume control.

is turned to the AUX. position, the auxiliary fuel shutoff valve must be opened (turned fully counterclockwise) to allow the fuel pump (13, fig. 6) to draw fuel from the auxiliary source. When operating from the fuel tank, the auxiliary fuel shutoff valve must be closed (turned fully clockwise).

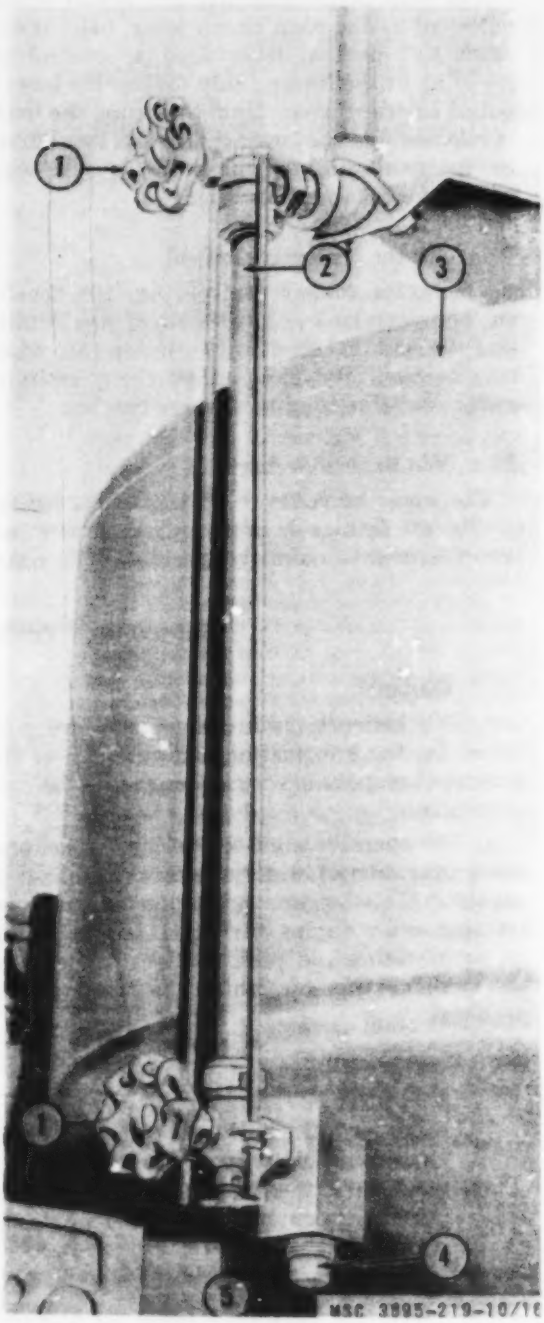
22. Engine Clutch Lever

The engine clutch lever (4, fig. 11) is located on the clutch housing at the rear of the engine. The forward position, toward the engine, engages the clutch.

Note. On cement mixers in serial No. range 148883 through 148982, the clutch lever is on the right side of the clutch housing; on those in serial No. range 153351 through 153609, it is on the left side.

23. Skip Clutch Lever

The skip clutch lever (4, fig. 14) is located on the left front side of the main frame (6). It is a manually operated lever used to engage the skip clutch (11, fig. 1). When pushed inward, toward the drum, the loading skip (2) raises until the skip clutch knockout arm (10) automatically disengages the clutch.



1 Water gage shutoff valve (2 rqr)
2 Water tank gage
3 Water tank
4 Drain plug
5 Draincock

Figure 16. Water gage and water gage shutoff valves.

24. Skip Brake Lever

The skip brake lever (5, fig. 14) is located outboard of the skip clutch lever (4). It is a manually operated lever used to control the lowering of the loading skip. When the lever is pulled outward, away from the drum, the brake is released and the loading skip will lower itself by its own weight-pushing the lever inward will slow or stop this lowering.

25. Water Volume Control

The water volume control (fig. 15), located on the water tank (5), consists of a calibrated dial (2) and dial shaft with pointer (3), which may be manually set to adjust the quantity of water used for mixing various batches.

26. Water Valve Lever

The water valve lever (2, fig. 14) is located on the left front side of the mixer superstructure (1), and is manually operated. The water valve lever is pulled outward to fill the water tank (3, fig. 16) and is pushed inward to start water flowing to the mixing drum from the tank.

27. Water Gage and Shutoff Valves

The water gage (2, fig. 16), located on the water tank (3) is a glass tube which indicates the quantity of water in the water tank. The two valves (1) on either end of the water gage, control the flow of water into the gage, and allow the flow to be shut off if the gage glass is broken or being replaced. These valves should be turned fully counterclockwise (open) when the water gage tube is intact.

28. Discharge Chute Handwheel

The discharge chute handwheel (10, fig. 2) is located on the left rear side of the superstructure. It is manually turned conterclockwise to raise and clockwise to lower the discharge chute (9).

Section III. OPERATION OF EQUIPMENT

29. General

a. The instructions in this section are published for the information and guidance of the personnel responsible for operation of the concrete mixer.

b. The operator must know how to perform every operation of which the concrete mixer is capable. This section gives instructions on starting and stopping the concrete mixer, and on coordinating the basic motions to perform the specific tasks for which the equipment is designed.

30. Starting

a. *Preparation for Starting.*

(1) Perform the daily preventive maintenance services (par. 46).

(2) Be sure the two stabilizers are in positive contact with the front axle (par. 7).

Warning: **Before operating the mixer, be sure the wheels are blocked so that the mixer cannot roll or slide.**

Caution: **Level the mixer as nearly as possible to insure safe operation.**

(3) Connect or disconnect, and prime the dual prime pump, as required (par. 7).

(4) Disengage the engine clutch (par. 22).

(5) To utilize auxiliary fuel source (serial number range 153351 through 153609 only) perform the following steps:

(*a*) Connect the auxiliary fuel line (par. 7).

(*b*) Set the three-way fuel valve for auxiliary fuel (par. 20).

(*c*) Open the auxiliary fuel shutoff valve (par. 21).

(*d*) Be sure the fuel filter shutoff valve (12, fig. 6) is fully open.

(6) If fuel from tank is to be utilized (serial No. range 153351 through 153609 only) make sure the fuel filter shutoff valve (12) is fully open and be certain the auxiliary fuel shutoff valve is fully closed (par. 21).

b. *Starting the Engine.*

(1) Remove the control panel door (1, fig. 11); remove both engine side doors (2) to allow air circulation around the engine.

(2) Make certain the engine clutch is disengaged (par. 22).

(3) Make certain the fuel tank shutoff valve is fully open (par. 19).
(4) If the engine is cold, push the choke control (6, fig. 13) fully into the START position.
(5) Set the throttle control (5) at one-quarter the distance between IDLE and RUN.
(6) Push the magneto switch (8) inward.
(7) Press the starter switch (3).

Caution: **Operate the starter intermittently and for short periods to avoid overheating it.**

(8) As the engine warms gradually move the choke control toward RUN until the engine idles smoothly. Set the throttle control at the RUN position when smooth performance has been attained.

Note. If it is desired to operate the engine without operating the cement mixer, set the throttle control at IDLE until such time as it is desired to operate the mixer, then again set the thorttle control at RUN.

c. Starting the Mixer.
(1) Unhook the skip safety chains (12, fig. 2).

Note. Inspect the mixing drum for the absence of water. Any water present must be deducted from the water requirement of the first batch to be mixed, or must be drained from the mixing drum (par. 6).

(2) Start the engine as outlined in *b* above.
(3) Check to see that the skip clutch is disengaged by moving the skip clutch lever (4, fig. 14) away from the drum.
(4) Engage the engine clutch by pushing the engine clutch lever (4, fig. 11) toward the engine. When properly adjusted the engine clutch will automatically lock in the engaged position. If clutch fails to lock in, report the condition to organizational maintenance.

Warning: **Do not place any part of the body or any object in or near the mixing drum or other rotating parts of the mixer when operating the mixer.**

(5) To take the slack out of the cables and test the skip clutch and brake, raise and lower the skip several times, leaving it in the lowered position. Refer to paragraphs 23 and 24. Adjust the skip brake, if necessary (par. 66).

Warning: **Make sure the area immediately below and above the skip is clear of objects and personnel prior to raising or lowering the skip.**

31. Stopping

a. Stopping the Mixer.
(1) Make certain the skip clutch lever (4, fig. 14) is in the disengaged position by moving the lever away from the mixing drum. For momentary shutdown the loading skip (2, fig. 1) may be in either the UP or DOWN position; but for extended shutdown, the skip must be in the UP position, and the skip safety chains (12, fig. 2) must be hooked to the skip.

Note. For overnight and longer shutdown, or in preparation for movement, prior to proceding with (1) above, thoroughly flush the mixing drum, the discharge chute, and the loading skip. In actual or expected below-freezing weather drain the water tank and gage, the water valve, and the dual prime pump as directed in paragraph 34, and drain all water from the mixing drum as directed in paragraph 6.

(2) Disengage the engine clutch by pulling the engine clutch lever (4, fig. 11) away from the engine.
(3) Place the discharge chute (9, fig. 2) in the mixing (raised) position.

b. Stopping the Engine.
(1) Stop the mixer as outlined in *a* above.
(2) Run the engine with no load at idle speed for 5 minutes to allow even engine cooling.
(3) Be sure the throttle control is set at IDLE position.
(4) Pull out the magneto switch (8, fig. 13).
(5) Be sure the choke control is set at RUN position.
(6) Perform the daily preventive maintenance services (par. 46).

32. Operating Details

a. General. To produce mixed concrete ready for use, start the engine and mixer as outlined in paragraph 30 and follow the steps outlined

below. These operating details are listed in the order in which they are to be performed.

b. Setting Water Volume Control. To set the water volume control (fig. 15) so that the desired amount of water for equal batches flows to the mixing drum, loosen the thumbscrew (4) until the cam wheel (1) can be moved. Turn the cam wheel counterclockwise until the pointer (3) indicates, on the calibrated dial (2), the pounds or gallons of water desired for the equal batches to be mixed. Tighten the thumbscrew to secure the cam wheel in this position.

c. Filling Water Tank. Fill the water tank by pulling the water valve lever (2, fig. 14) out. Open both water gage shutoff valves (1, fig. 16). Watch the water gage (2) to see that the tank fills properly. Check gage and tank for leaks: correct leaks or notify Organizational Maintenance.

d. Loading Skip. Place one-half the portion of sand, stone, or gravel to be used in the batch in the loading skip. Add the proper amount of cement, then the remainder of the sand, stone, or gravel. This procedure puts the cement between the heavier aggregates and eliminates excessive dust and waste when the batch is deposited in the mixing drum. It also reduces packing or sticking in the skip and drum.

Caution: **Do not overload the skip or drum at any time.**

e. Starting Water into Mixing Drum. Just before charging the drum with the batch, push the water valve lever (2, fig. 14). This starts the water into the mixing drum. The water should enter the drum at about 45° from vertical, toward the right when facing the mixer from the rear. Any appreciable deviation in the direction of water flow should be reported to Organizational Maintenance.

f. Hoisting Loading Skip and Charging Drum. Immediately after starting water into the mixing drum (3, fig. 14) push the skip clutch lever (4) toward the drum and pull the skip brake lever (5) away from the drum, raising the loading skip and charging the mixing drum with the batch. The skip clutch knockout arm (10, fig. 1) will automatically disengage the skip clutch when the skip reaches its uppermost point of travel. The skip bumper (9) will then vibrate the skip to loosen sticking material and deposit it in the drum.

g. Mixing Batch. With average materials and batch size, a thorough mix requires 1 to ½ minutes after all materials and water are in the drum. Mix the batch thoroughly before discharging any portion of it from the mixing drum.

h. Releasing Loading Skip. While the batch is mixing, return the loading skip to the ground for reloading. To release the skip, apply a steady pressure to the skip brake lever (5, fig. 14), pulling it outward to release the brake. Using the brake lever to control speed, lower the skip slowly and evenly to prevent fouling the hoist cables and to keep the skip from hitting the ground hard enough to cause damage.

i. Refilling Water Tank and Reloading Skip. When another identical batch is to be mixed immediately, the water tank and loading skip may be prepared for that next batch while the first batch is mixing and being discharged from the drum. Follow the instructions in *c* and *d* above.

j. Discharging Batch from Drum. When the batch is thoroughly mixed and ready for discharging, turn the discharge chute handwheel (10, fig. 2) clockwise to place the discharge chute into discharging position. The batch can be discharged at one time, or in partial quantities as needed, by operation of the discharge chute handwheel.

Note. The discharge chute handwheel will continue to turn a short distance in a counterclockwise direction after the chute reaches the mixing (raised) position. This extra movement locks the chute in position. Always lock the chute when in the mixing position to prevent the chute from sliding into the discharge (lowered) position and accidentally discharging concrete from the mixer.

Note. If the batch being mixed is extremely dry, the materials may tend to carry over and not discharge properly. This can be remedied by reducing the drum rotation speed. If the batch is extremely wet, the materials may not carry high enough to fall into the discharge chute. Increase the drum rotation speed to remedy this condition.

k. Intermittent Mixing. When extended intervals occur between batches, the mixer should be flushed with water to prevent cement residue in the mixer from setting up. This is especially important in hot weather or when using heated materials in cold temperatures. The idle time interval will vary with conditions, but under normal conditions an idle time of 45 minutes or more will require a flushout. Water used to

flush the mixing drum can be used in mixing the next batch, provided the quantity left in the drum is deducted from the requirement for the next batch.

33. Operation in Extreme Heat

a. Engine.

(1) *Cooling system.* Keep the engine clean and free from dirt and grease. Check the coolant level daily. Avoid using coolant that contains substances likely to cause scale and rust. Do not use a dirty or oily container when filling or adding coolant to the radiator. Make sure the engine fan V-belt is adjusted for correct tension (par. 63).

(2) *Lubrication.* Lubricate the engine in accordance with the current lubrication order.

b. Mixer.

(1) *Cleaning.* Keep the mixer clean and free from dust and dirt. Use a hose or bucket and brush on the outside of the mixer. Flush the mixing drum immediately after mixing the last batch, or between batches if the interval is longer than 45 minutes under normal conditions.

(2) *Lubrication.* Lubricate the mixer in accordance with the current lubrication order.

34. Operation in Extreme Cold (Below 0°F.)

a. Engine.

(1) Keep the fuel tank as full as possible to avoid condensation.

(2) Remove ice and snow from the fuel tank cap and fuel dispensing equipment before filling the fuel tank.

(3) Service the fuel filter daily to remove any water collected there (par. 61).

(4) Lubricate the engine for cold weather conditions in accordance with the current lubrication order.

(5) See that the antifreeze solution has been checked for the lowest temperature expected.

(6) During warm up, run the engine till it reaches normal operating temperature before applying a load.

b. Mixer.

(1) Make sure no water remains in the water tank (3, fig. 16), water tank gage (2), water valve, or dual prime pump (6, fig. 2) when the mixer is not operating. Disconnect, or close the supply line valves of a pressurized water supply, and protect the supply line against freezing. A drain plug (4, fig. 16) is provided for draining the water tank. When draining the tank, leave both water gage shutoff valves (1) open and open the draincock (5) to drain the gage with the tank. To drain the water valve, remove the 2 plugs from the bottom of the valve and the 2 plugs at the top of the valve. The dual prime pump has a drain plug (7, fig. 2) at the bottom of the pump suction head.

(2) Clean the mixer frequently. Flush out the drum frequently when using heated materials. Rotate drum to put drain plug (2, fig. 8), located to rear of segmental gear and opposite a gear joint, at lowest point of drum; remove drain plug and all water from drum; replace drain plug.

(3) Lubricate the mixer for cold weather conditions in accordance with the current lubrication order.

(4) If possible, store lubricants and fuel where they will be protected from temperatures below freezing.

c. Electrical System.

(1) Inspect wiring for cracks, breaks, fraying, and loose connections. Tighten all loose connections and report damaged wiring to organizational maintenance.

Note. Insulation on wires becomes brittle in extreme cold, and will break if twisted or bent. Disturb wiring as little as possible while inspecting or removing moisture or snow.

(2) Check the battery electrolyte for proper level and see that the batteries are fully charged, as directed in paragraph 6. The danger of freezing varies with the specific gravity of the electrolyte.

Caution: **Water added to a battery may freeze unless it is immediately mixed with electrolyte by charging.**

Do not add water unless the engine is immediately operated for at least 1 hour.

(3) Make sure that the vent holes in the battery filler caps (4, fig. 7) are not clogged.

(4) See that the battery quick disconnectors (2) are tight, clean, and lightly coated with a general purpose grease to retard corrosion.

35. Operation in Rainy and High Humidity Areas

a. When the mixer is not operating, protect the engine and loading skip clutch with waterproof covers. Remove the covers and the engine side doors (2, fig. 11) during dry periods to aid drying. Dry the engine and loading skip clutch before operating.

b. Inspect painted surfaces for cracked or peeling paint. Coat exposed surfaces with an approved rustproofing material and report the condition to Organizational Maintenance.

c. Keep the fuel tank full to avoid condensation. Service the fuel filter frequently to remove water which may have collected there (par. 61).

d. Lubricate the mixer in accordance with the current lubrication order.

36. Operation in Salt Water Areas

a. Cleaning. Wash the mixer frequently with clean, fresh water to prevent salt water corrosion. When possible, use natural barriers, or have a barrier erected to protect the mixer.

b. Lubrication. Lubricate the mixer in accordance with the current lubrication order.

c. Cooling System. Use fresh, clean water in the cooling system. Water containing salt or alkali will damage the equipment.

Caution: **Salt water may be used in the cooling system as an emergency measure, but the cooling system should be thoroughly cleaned with an approved cleaner and flushed out with fresh, clean water at the earliest availability of fresh water.**

d. Preservation and Painting. Inspect all painted surfaces for cracked, peeled, or blistered paint. Coat all exposed metal areas with a light coat of grease. Paint all exposed nonpolished areas or report the condition to Organizational Maintenance.

37. Operation at High Altitude

Service the air cleaner and the filler cap and level gage (par. 44) daily to provide maximum air circulation to the engine. If the engine shows signs of reduced power and undue strain, reduce the volume of each batch mixed in the concrete mixer. Be sure the engine choke is in operating position and opened when the engine is running.

38. Operation in Dusty or Sandy Areas

a. General. Dust and sand will shorten the life of mechanical parts. If possible, locate the concrete mixer on the upwind side of dusty installations, roadways, and construction work. Make use of all natural barriers or erect protective shields when possible. Wipe down the mixer at frequent intervals. Keep the unit as clean as possible, paying particular attention to the engine, loading skip clutch, and brake. Use compressed air, if available, to aid in cleaning.

b. Lubrication. When operating in dusty or sandy areas, the air cleaner and oil filter must be cleaned and the element replaced more frequently. Clean all lubrication points before applying lubricants. Lubricate in accordance with the current lubrication order.

c. Cooling System. Inspect the cooling system frequently for leaks and other defects. Make sure the radiator cap is on tight and that the fan belt is adjusted properly. Clean and flush the cooling system at more frequent intervals.

d. Fuel System. Take all precautions necessary to keep dust and sand out of the fuel system. Clean the area around the fuel tank filler and the spout of dispensing equipment before adding fuel. Clean the fuel filler cap, fuel tank strainer, and fuel filter frequently (par. 61).

e. Mixer. Keep the exterior of the mixer clean and free of dust and dirt. Flush out the mixing drum immediately after use, as directed in paragraph 34. Remove spilled concrete from the mixer components before it has a chance to harden or set up.

Section IV. OPERATION OF AUXILIARY MATERIEL USED IN CONJUNCTION WITH THE CONCRETE MIXER

39. Fire Extinguisher (Momobromotrifluoromethane-Type, Serial No. Range 148883 through 148982

a. Description. The momobromotrifluoromethane-type extinguisher is generally suitable for all types of fires, except fires involved with liquid oxygen generating equipment. The fire extinguisher is furnished with a disposable-type cylinder.

b. Operation.

(1) Remove the fire extinguisher from its location.

(2) Break the seal by pulling the safety pin from the handle.

(3) Point the horn at the base of the flame.

(4) Depress the trigger and direct the stream at the base of the flame.

Warning: **Avoid breathing smoke.**

(5) Replace the cylinder immediately after using.

c. Replacement of Cylinder.

(1) Press lever to release pressure from the used cylinder.

(2) Loosen swivel valve coupling nut and remove the valve assembly from the used cylinder.

(3) Remove instruction band from the used cylinder.

(4) Place new cylinder through the insulation band.

(5) Replace safety pin in the valve and seal pin with sealing wire.

(6) Attach valve assembly and tighten swivel coupling nut on the new cylinder and place fire extinguisher in the mounting bracket.

(7) Adjust instruction band on the cylinder to show maintenance and operating instructions.

d. Maintenance. Weigh fire extinguisher every 6 months. Replace cylinder if gross weight has decreased 4 ounces or more. Lubricate cylinder neck threads with 1 drop of OE 30 oil before reassembly.

40. Fire Extinguisher (Dry Chemical Type), Serial No. Range 153351 Through 153609

a. Description. The dry chemical type fire extinguisher is effective in areas where ambient temperature is −25° F. and above. If winterized (pressurized with nitrogen), the fire extinguisher may be used in temperatures below −25° F. The fire extinguisher is a 2½-pound, stored pressure, lever-operated extinguisher.

b. Operation. Remove the fire extinguisher from its location, lift the handle, press lever, and direct the powder at the base of the flame using a side-to-side sweeping motion.

c. Maintenance. Weigh the fire extinguisher every 6 months. Replace the extinguisher if weight is less than 4½ pounds, or if pressure is below 125 pounds. Refer to SB 5–111. The dry chemical fire extinguishers will be serviced at installation level through repair and utilities facilities, with the filling agent supplied by local procurement through troop supply channels.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S TOOLS AND EQUIPMENT

41. Special Tools and Equipment

No special tools or equipment are required by the operator for the maintenance of this concrete mixer.

42. Basic Issue Tools and Equipment

Tools and repair parts issued with or authorized for the concrete mixer are listed in the basic issue items list, appendix II of the manual.

Section II. LUBRICATION

43. General Lubrication Information

a. This section contains a reproduction of the lubrication order and lubrication instructions which are supplemental to, and not specifically covered in, the lubrication order.

b. The lubrication order shown in figure 17 is an exact reproduction of the approved lubrication order for the concrete mixer. For the current lubrication order refer to DA Pam 310–4.

44. Detailed Lubrication Information

a. Care of Lubricants. Keep all lubricants in closed containers. Store containers in a clean, dry place away from extreme heat. Allow no dirt, dust, water or foreign material to mix with the lubricants at any time.

b. Cleaning. Clean all lubricating equipment periodically. Clean all lubrication points and surrounding surfaces before lubricating. Clean with an approved cleaning solvent and dry thoroughly.

c. Points of Application. Illustrations of the application points of the lubrication are shown in figure 17, references 1 through 33. Apply only the lubricants specified in the lubrication order.

d. Operation After Lubrication. Operate the concrete mixer for 5 minutes after lubrication. Stop the mixer, wait 5 minutes and recheck the level of the engine oil (ref. 32, fig. 17) and drive chain guard oil (ref. 15). Add oil as required.

e. Servicing Air Cleaner and Hose (Serial No. Range 148883 Through 148982). Servicing intervals and operations are prescribed by the current lubrication order. To service the air cleaner and hose proceed as follows:

(1) *Air Cleaner.*

(*a*) Loosen the screw (7, fig. 18) in the retainer (4) and detach the retainer and oil cup (6) from the body (1). Discard the oil.

(*b*) Clean the oil cup with approved cleaning solvent and dry thoroughly.

(*c*) Refer to the current lubrication order and fill the oil cup to the level mark (5) with the proper grade oil.

(*d*) Position the oil cup and retainer on the body and secure by tightening the screw (7).

Note. Perform (2) below only occasionally or if the air cleaner hose is known to be dirty or clogged.

(2) *Hose.*

(*a*) Loosen the hose clamp (2, fig. 18) and remove the hose (3) from the body (1). Loosen the hose clamp and remove the hose from the carburetor in the same way.

(*b*) Remove the hose from the engine housing.

(*c*) Clean the inside of the hose with compressed air and a clean, dry, lint-free cloth.

(*d*) Install the hose in the engine housing.

(*e*) Position the hose on the air cleaner body and secure by tightening the hose clamp. Attach the hose to the carburetor in the same way.

LUBRICATION ORDER

LO 5-3895-219-20-1

20 MAY 1963 (Supersedes LO 5-3895-219-20-1, 8 SEPT 1961)

MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN; 16 CU FT (CONSTRUCTION MACHINERY MODEL 16 SM) W/ENGINE CONTINENTAL MODEL YS116

REFERENCE: LO 5-3895-219-20-2, [illegible]

Intervals are based on normal operation. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

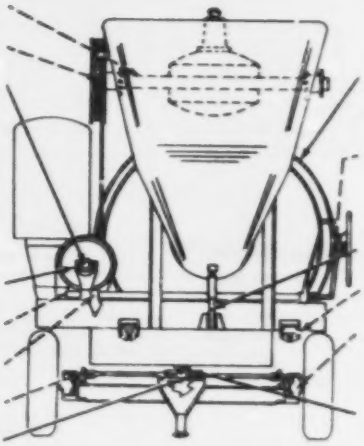
Clean fittings before lubricating.

Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of the equipment.

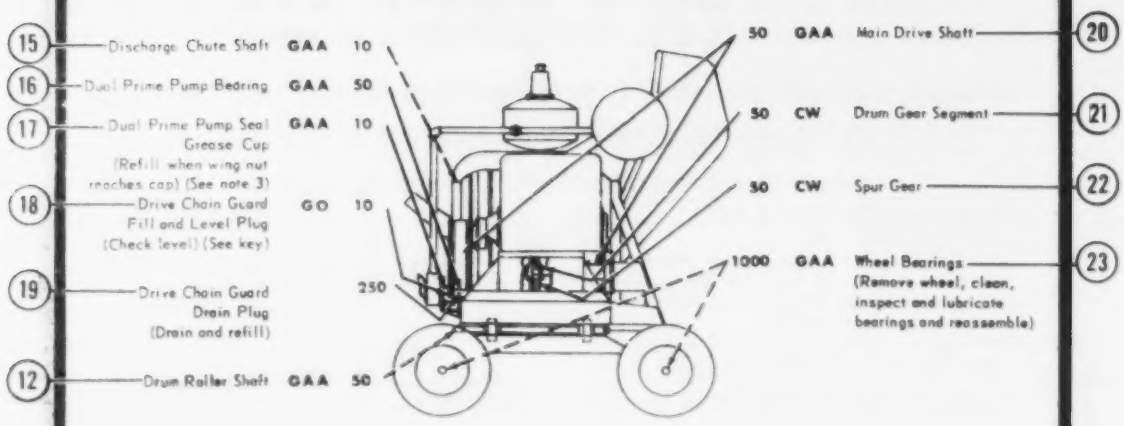
	LUBRICANT	INTERVAL
1 Skip Pulley Shaft	GAA	10
2 Hoist Cables	CW	50
3 Hoist Drum Sleeve Bearing	GAA	10
4 Shifter Cone Collar	GAA	10
5 Brake Shaft	GAA	10
6 Clutch Shaft	GAA	10
7 Tie Rod End	GAA	50
8 Steering Arm (Sparingly)	GAA	50



	INTERVAL	LUBRICANT
9 Discharge Roller Chain (Remove plug in top of chain guard to lubricate)	50	OE
10 Handwheel Shaft	10	GAA
11 Skip Bumper	10	GAA
12 Drum Roller Shaft	50	GAA
13 King Pins	50	GAA
14 Tie Rod Center Pivot Pin	50	GAA

NSC 3895-219-10/17 ①

Figure 17. Lubrication order.


LUBRICANT • INTERVAL
INTERVAL • LUBRICANT
15 Discharge Chute Shaft GAA 10
16 Dual Prime Pump Bearing GAA 50
17 Dual Prime Pump Seal Grease Cup (Refill when wing nut reaches cap) (See note 3) GAA 10
18 Drive Chain Guard Fill and Level Plug (Check level) (See key) GO 10
19 Drive Chain Guard Drain Plug (Drain and refill) 250
12 Drum Roller Shaft GAA 50
50 GAA Main Drive Shaft 20
50 CW Drum Gear Segment 21
50 CW Spur Gear 22
1000 GAA Wheel Bearings (Remove wheel, clean, inspect and lubricate bearings and reassemble) 23

– KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above + 32° F	+ 40° F to – 10° F	0° F to – 65° F	
OE – OIL, Engine, Heavy Duty		OE 30 or 9250	OE 10 or 9110	OES	Intervals given are in hours of normal operation.
Oil Can Points					
OES – OIL, Engine, Subzero					
GO – LUBRICATING OIL, Gear		GO 90	GO 90	GOS	
Drive Chain Guard	3/4 qt				
GOS – LUBRICATING OIL, Gear, Subzero					
GAA – GREASE, Automotive and Artillery		All Temperatures			
CW – LUBRICATING OIL, Exposed Gear					

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW –10° F. Remove lubricants prescribed in the key for temperatures above –10° F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below –10° F.

2. OIL CAN POINTS. Every 50 hours clean and lightly coat the control linkage and all exposed adjusting threads with OE.

3. GREASE CUP. To fill cup: turn wing nut clockwise to cap, remove cap, fill cup, replace cap and turn wing nut counterclockwise to top of shaft.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory.

BY ORDER OF THE
SECRETARY OF THE ARMY:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

OFFICIAL:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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Figure 17—Contitnued.

LUBRICATION ORDER

LO 5-3895-219-20-2

20 MAY 1963 (Supersedes LO 5-3895-219-20-2, 4 JAN 1961)

MIXER, CONCRETE, TRAILER MOUNTED: GASOLINE DRIVEN; 16 CU FT (CONSTRUCTION MACHINERY MODEL 16 SM) W/ENGINE CONTINENTAL MODEL YS116

REFERENCE: LO5-3895-219-20-1-1, CO100-SL

Intervals are based on normal operation. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

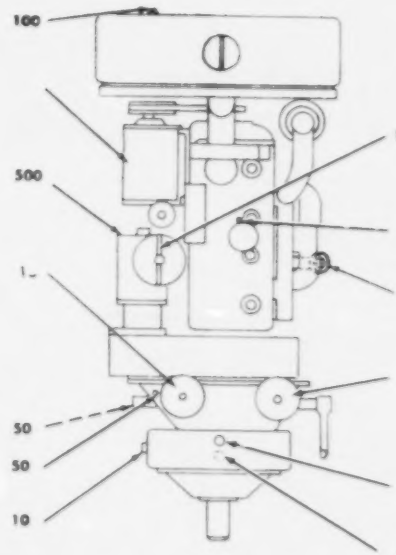
Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Drain crankcase when hot. Fill and check level.

Dotted circle indicates drain below.

	LUBRICANT	INTERVAL
24	Engine Drain Plug (Drain and refill)	100
	Generator (Sealed bearings, no lubrication required)	
25	Starter (Sparingly)	OE 500
26	Air Cleaner (Refill oil reservoir to level mark, every 50 hours disassemble entire unit, clean, re-oil and reassemble) (See key) (below serial No. 149983)	OE 1
27	Clutch Shifter Yoke	OE 50
28	Clutch Bearing (Sparingly)	GAA 50
29	Gear Housing Level Plug (Check leve	10



	INTERVAL	LUBRICANT
30	100	Oil Filter (Disassemble, clean housing, renew element and reassemble) (See note 2)
31	50	GAA Tachometer Drive (Turn cup down 1 turn)
32	10	OE Oil Fill Cap and Level Gage (Check level) (See key)
33	10	OE Air Cleaner (Refill oil reservoir to level mark, every 50 hours disassemble entire unit, clean, re-oil and reassemble)(See key) (above serial No. 153350)
34		GO Gear Housing Fill Plug (See key)
35	250	Gear Housing Drain Plug (Drain and refill)

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Figure 17—Contitnued.

– KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F	+40°F to –10°F	0°F to –65°F	
OE -OIL, Engine, Heavy Duty					
Crankcase	5-1/2 qt	OE 30 or 9250	OE 10 or 9110	OES	Intervals given are in hours of normal operation.
Air Cleaner (below serial No 148983)	1/2 qt				
Air Cleaner (above serial No 153350)	1 qt				
Oil Can Points					
OES OIL, Engine, Subzero					
GO LUBRICATING OIL, Gear		GO 90	GO 90	GOS	
Gear Housing	1-1/2 qt				
GOS LUBRICATING OIL, Gear, Subzero					
GAA -GREASE, Automotive and Artillery		All Temperatures			

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW –10°F. Remove lubricants prescribed in the key for temperatures above –10°F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below –10° F.

2. OIL FILTERS. After installing new filter elements, fill crankcase, operate engine 5 minutes, check housings for leaks, check crankcase oil level and bring to full mark.

3. OIL CAN POINTS. Every 50 hours clean and lightly coat the governor, control linkage and all exposed adjusting threads with OE.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory.

BY ORDER OF THE
SECRETARY OF THE ARMY:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

OFFICIAL:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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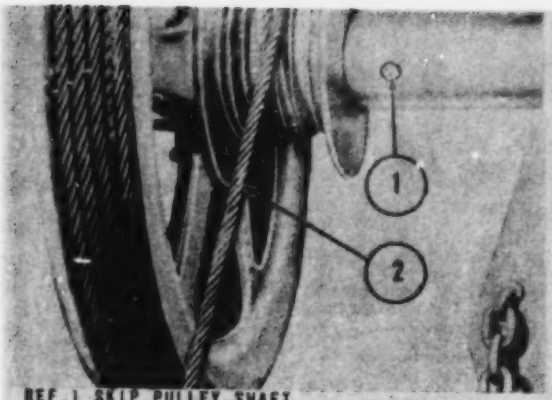
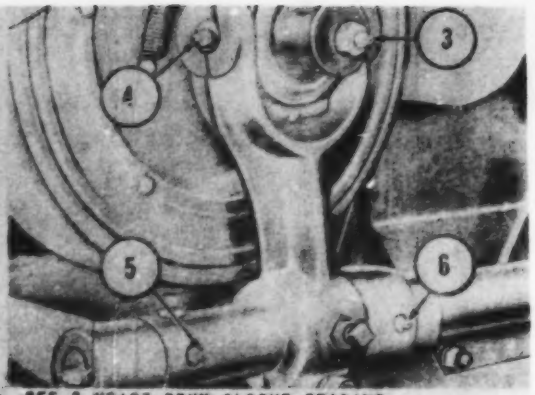
Back

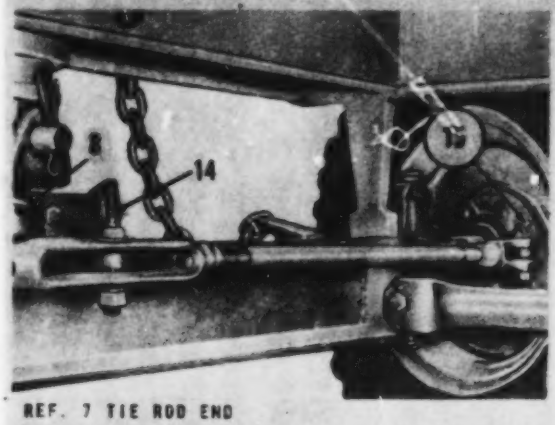
Figure 17—Contitnued.



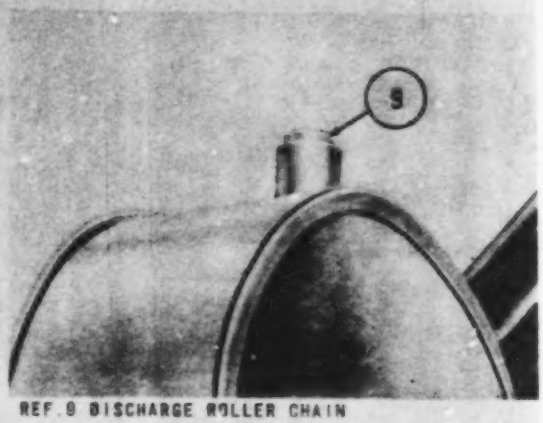
REF.1 SKIP PULLEY SHAFT
REF.2 HOIST CABLES



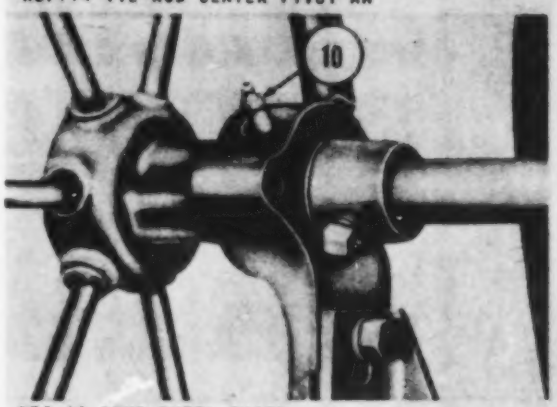
REF.3 HOIST DRUM SLEEVE BEARING
REF.4 SHIFTER CONE COLLAR
REF.5 BRAKE SHAFT
REF.6 CLUTCH SHAFT



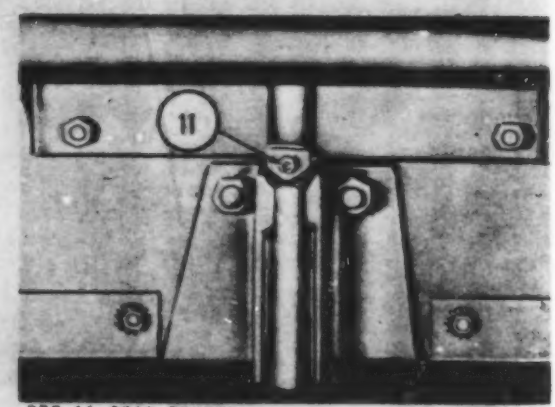
REF. 7 TIE ROD END
REF. 8 STEERING ARM
REF.14 TIE ROD CENTER PIVOT AN



REF.9 DISCHARGE ROLLER CHAIN



REF.10 HAND WHEEL SHAFT

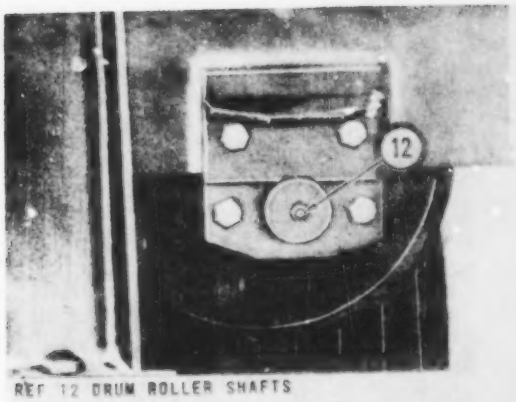


REF.11 SKIP BUMPER

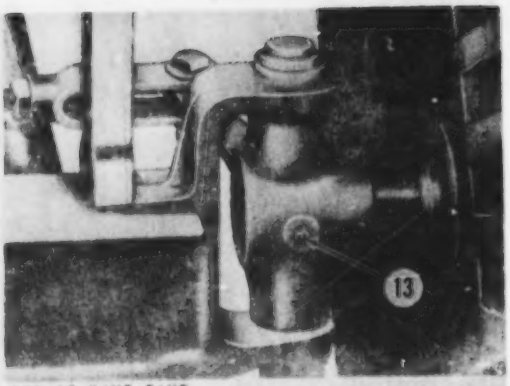
MSC 3895-219-10/17 (5)

Reference points 1 through 11, and 14

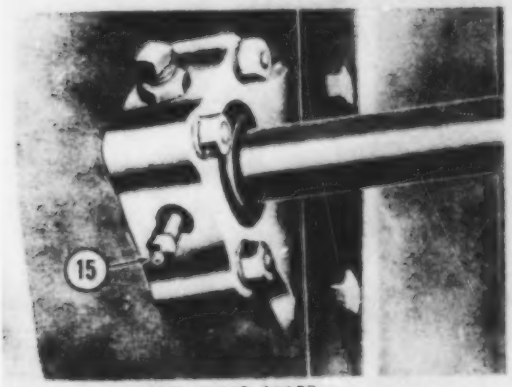
Figure 17—Contitnued.



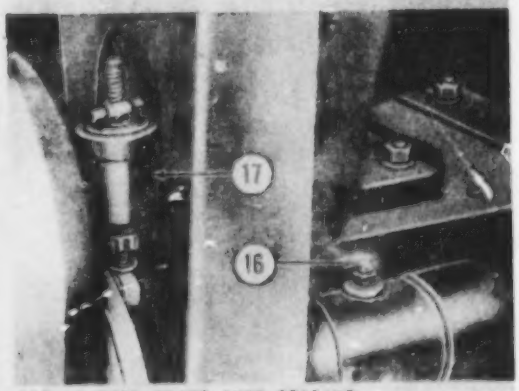
REF. 12 DRUM ROLLER SHAFTS



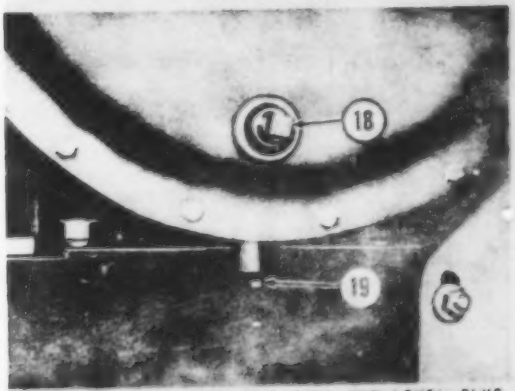
REF. 13-KING PINS



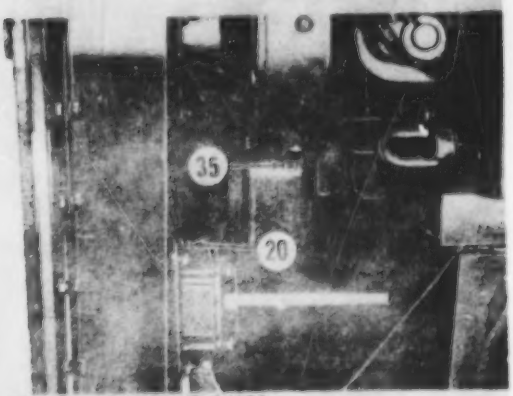
REF. 15-DISCHARGE CHUTE SHAFT



REF. 16 DUAL PRIME PUMP BEARING
REF. 17-DUAL PRIME PUMP SEAL GREASE CUP



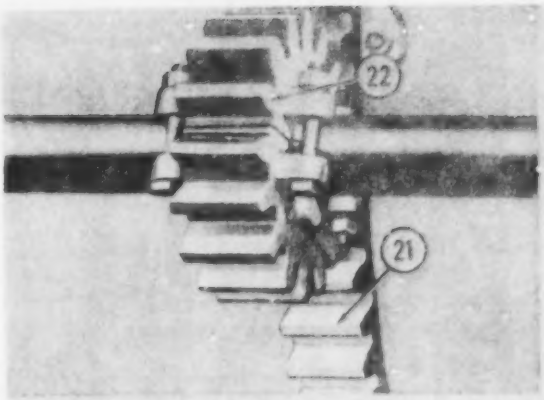
REF. 18-DRIVE CHAIN GUARD FILL AND LEVEL PLUG
REF. 19-DRIVE CHAIN GUARD DRAIN PLUG



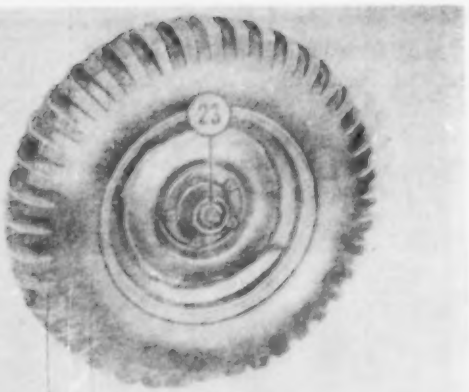
REF. 20-MAIN DRIVE SHAFT
REF. 35-GEAR HOUSING DRAIN PLUG
MSC 3895-219-10/17 (6)

Reference points 12 through 20, and 35

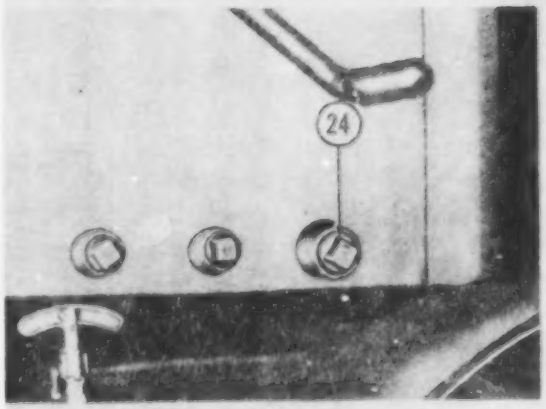
Figure 17—Contitnued.



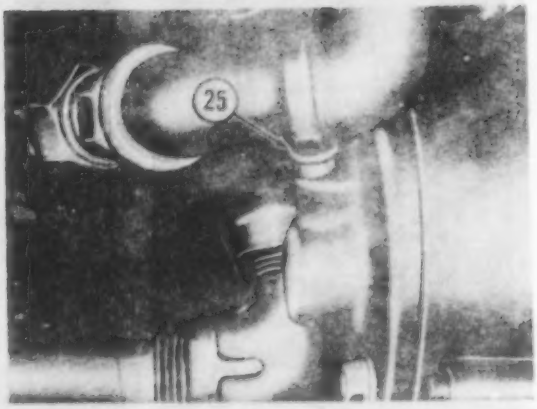
REF. 21 - DRUM GEAR SEGMENT
REF. 22 - SPUR GEAR



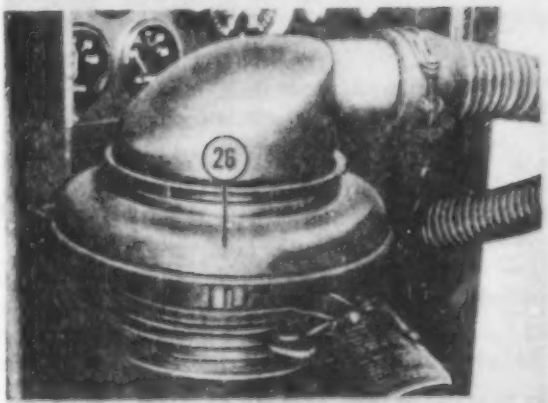
REF. 23 - WHEEL BEARINGS



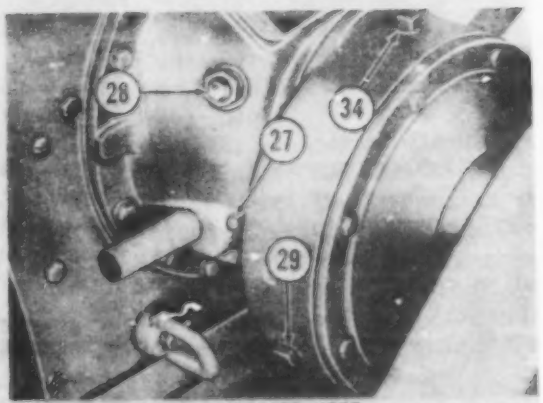
REF. 24 - ENGINE DRAIN PLUG



REF. 25 - STARTER



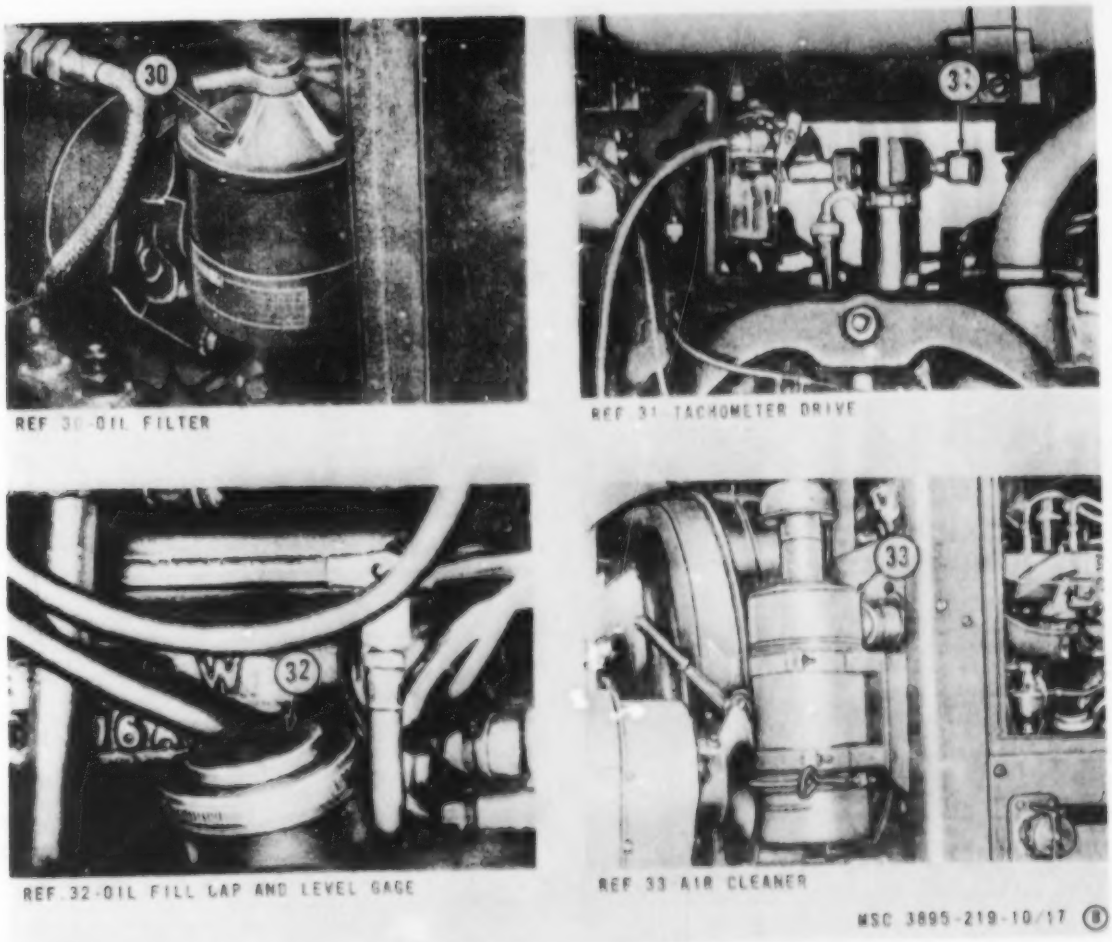
REF. 26 - AIR CLEANER



REF. 27 - CLUTCH SHIFTER YOKE
REF. 28 - CLUTCH BEARINGS
REF. 29 - GEAR HOUSING LEVEL PLUG
REF. 34 - GEAR HOUSING VENT AND FILL PLUG
MSC 3895-319-10/17 (7)

Reference points 21 through 29, and 34

Figure 17—Contitnued.



Reference points 30 through 33

Figure 17—Contitnued.

(3) *Field expedient repairs.* If the air cleaner or hose becomes obstructed, remove the hose as directed in (2) above, and operate the mixer without benefit of an air cleaner.

Caution: **Replace the air cleaner or hose promptly, as operation with unfiltered air may damage the engine.**

f. Servicing Air Cleaner and hose (Serial No. Range 153351 Through 153609).

(1) *Air cleaner.*

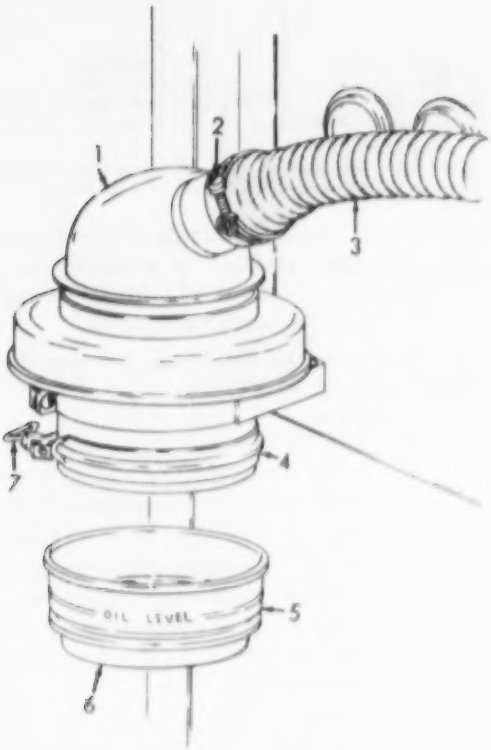
(*a*) Remove the cap (1, fig. 19) from the body (2).

(*b*) Loosen the clamp thumbscrew (4) and remove the clamp (3), outer cup (7), and inner cup (6) from the body. Separate the clamp, outer cup, and inner cup. Discard the oil in the outer cup.

(*c*) Clean all parts in approved cleaning solvent and dry thoroughly. See that the rubber gasket (5) is properly installed on the rim of the inner cup.

(*d*) Refer to the current lubrication order and fill the outer cup (7) to the OIL LEVEL mark with the proper grade oil.

(*e*) Place the inner cup (6) in the outer cup. Position the clamp (3) and both cups on the body (2) and



MSC 3895-219-10/18

1 Body
2 Hose clamp (2 req)
3 Hose
4 Retainer
5 Level mark
6 Oil cup
7 Screw (spec.)

Figure 18. Air cleaner, partially exploded view (serial No. range 148883 through 148982).

tighten the clamp thumbscrew (4) to secure the parts together.

(*f*) Install the cap (1) on the body.

(2) *Hose.*

(*a*) Loosen the hose clamp (8, fig. 19) and remove the hose from the body (2). Loosen the hose clamp and remove the hose from the carburetor in the same way.

(*b*) Remove the hose from the engine housing.

(*c*) Clean the inside of the hose with compressed air and a clean, dry, lint-free cloth.

(*d*) Install the hose in the engine housing.

(*e*) Position the hose (9) on the carburetor and on the air cleaner body (2) and secure by tightening the hose clamp (8).

(3) *Field expedient repairs.* If the air cleaner or hose becomes obstructed, remove the hose as directed in step (2) above, and operate the mixer without benefit of an air cleaner.

Caution: **Replace the air cleaner or hose promptly, as operation with unfiltered air may damage the engine.**

g. Servicing Oil Filter (Serial No. Range 148883 Through 148982).

(1) *Service.*

(*a*) Loosen the screw in the mounting clamp (5, fig. 20) and lower the body (6) as necessary to provide space to remove the cover (2).

(*b*) Loosen the cover screw (1) and remove the cover (2) and gasket (3) from the body. Discard the gasket.

(*c*) Remove and discard the filter element (4).

(*d*) Syphon and discard the residual oil from the filter body. Clean the filter body inner surface with a clean, lint-free cloth soaked in cleaning solvent, and dry thoroughly.

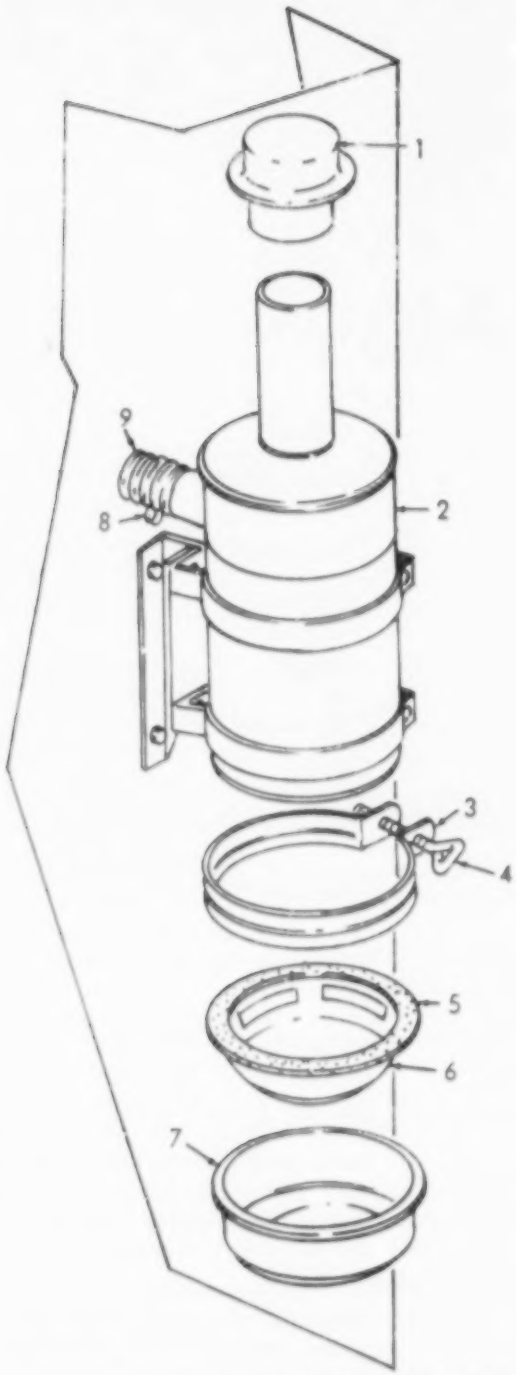
(*e*) Install a new filter element (4) in the body (6). Install a new cover gasket (3) and install the cover (2). Tighten the cover screw (1). Position the body as necessary, and tighten the screw in the mounting clamp (5).

(*f*) Start the engine, as directed in paragraph 30, and allow the oil to fill the filter. Stop the engine, as directed in paragraph 31, and allow the oil to drain into the oil pan before checking the oil level with the level gage (10, fig. 6). Add sufficient oil to bring the level up to the full mark on the gage.

(2) *Field expedient repair.*

(*a*) *Filter gasket leaking.* Remove the gasket, turn it over and reinstall it.

(*b*) *Filter element clogged.* Remove and discard the element. Install the gasket and cover and operate the mixer.



MSC 3895-218-10/19

1 Cap
2 Body
3 Clamp
4 Clamp thumbscrew
5 Rubber gasket
6 Inner cup
7 Outer cup
8 Hose clamp (2 rqr)
9 Hose

Figure 19. Air cleaner, partially exploded view (serial No. range 153351 through 153609).

Caution: **Replace the discarded filter element as promptly as possible. Operation with unfiltered oil may damage the engine.**

h. Servicing Oil Filter (Serial No. Range 153351 Through 153609).

(1) *Service.*

(*a*) Loosen the bolt (1, fig. 21) and remove the cover (2) and gasket (3) from the body (5). Remove and discard the element (4) and gasket.

(*b*) Syphon and discard the residual oil from the filter body. Clean the body inner surface with approved solvent and a clean, lint-free cloth and dry thoroughly.

(*c*) Install a new element (4) in the body (5). Install a new gasket (3) and the cover (2) and secure in place by tightening the bolt (1).

(*d*) Start the engine, as directed in paragraph 30, and allow the oil to fill the filter. Stop the engine, as directed in paragraph 31, and allow the oil to drain into the oil pan before checking the oil level with the level gage (10, fig. 6). Add sufficient oil to bring the level up to the full mark on the gage.

(2) *Field expedient repair.*

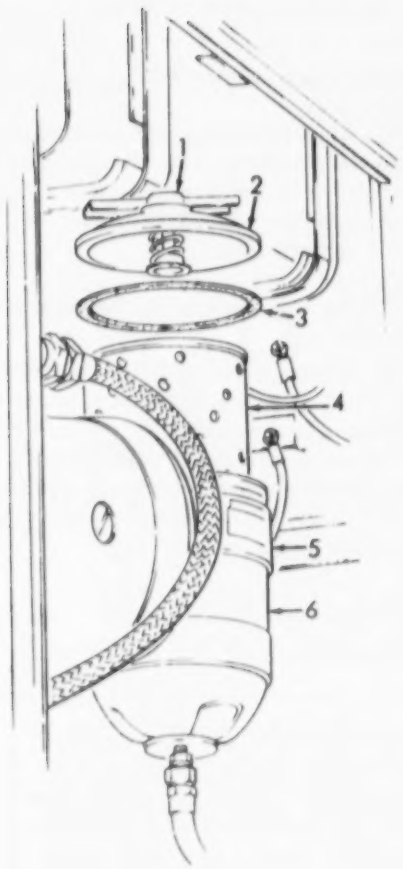
(*a*) *Filter gasket leaking.* Remove the gasket, turn it over and reinstall it.

(*b*) *Filter element clogged.* Remove and discard the element. Install the gasket and cover and operate the mixer.

Caution: **Replace the discarded filter element as promptly as possible. Operation with unfiltered oil may damage the engine.**

i. Servicing Oil Filter Cap and Level Gage.

(1) Remove the oil filler cap and level gage (10, fig. 6) and remove any accumulated dirt or foreign matter from



EMC 3895-219-10/17

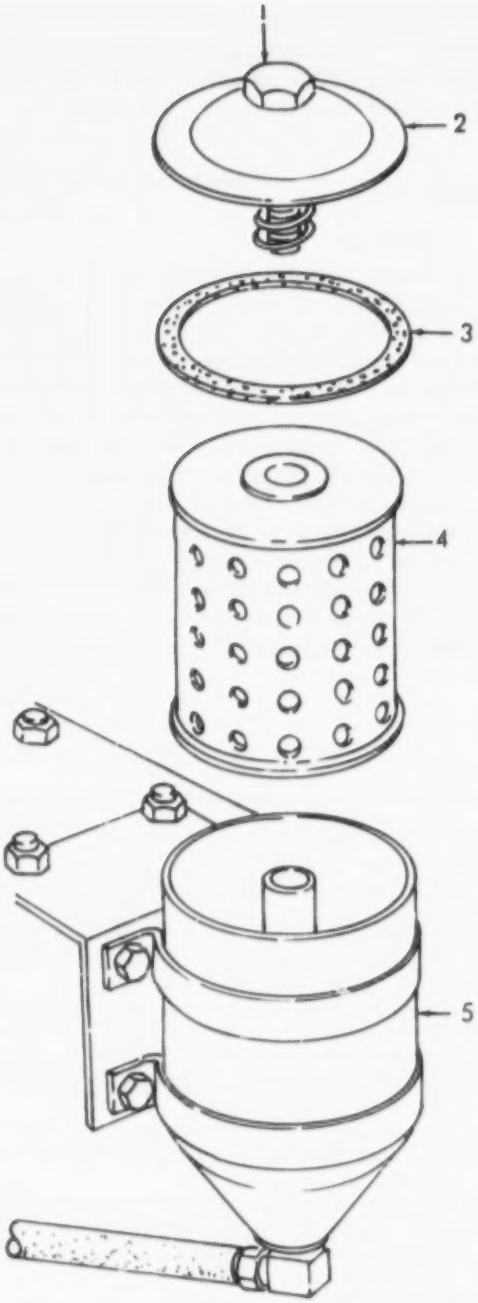
1 Cover screw
2 Cover
3 Gasket
4 Filter element
5 Mounting clamp
6 Filter body

Figure 20. Oil filter, partially exploded view (serial No. range 148883 through 148982).

the cap. Wash the filler cap and level gage in cleaning solvent, and dry thoroughly.

(2) Install the oil filler cap and level gage.

j. Servicing Drum Gear, Drive Spur Gear, and Hoist Cables. Service the drum gear (ref. 21, fig. 17), spur gear (ref. 22) and skip hoist cables (ref. 2) by coating them with a light coat of grease as prescribed in the current lubrication order.



MSC 3895-219-10/21

1 Bolt (spec)
2 Cover
3 Gasket
4 Element
5 Body

Figure 21. Oil filter, partially exploded view (serial No. range 153351 through 153609).

k. Servicing Discharge Roller Chain. Remove the plug (ref. 9, fig. 17) in the top of the chain guard. Drop a few drops of oil on the chain, rotating the discharge chute handwheel (10, fig. 2) at the same time in order to lubricate the whole chain. Install the plug. Refer to the current lubrication order for the proper grade of oil and the required interval.

Section III. PREVENTIVE MAINTENANCE SERVICES

45. General

To insure that the concrete mixer is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraph 46. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded, together with the corrective action taken, on DA Form 2404 Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

46. Daily Preventive Maintenance Services

This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 22 for the daily preventive maintenance services.

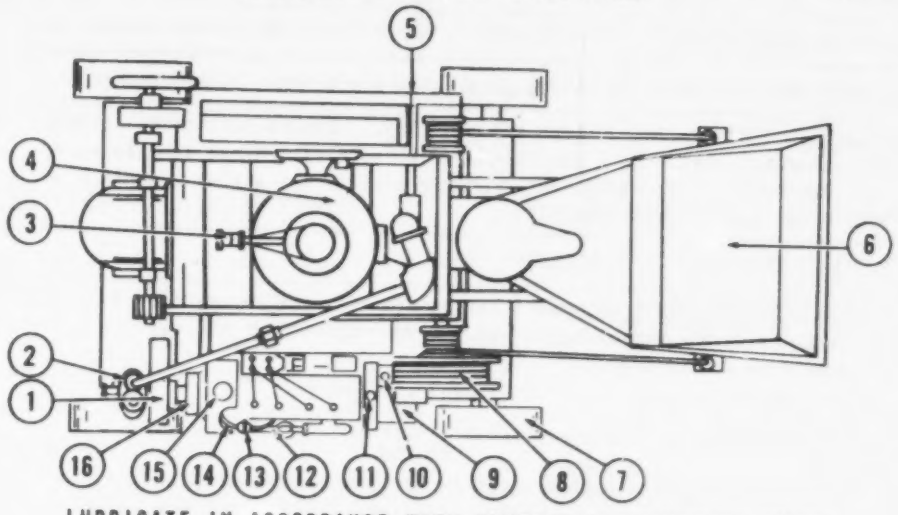
PREVENTIVE MAINTENANCE SERVICES

DAILY

TM5-3895-219-10

CONSTRUCTION MACHINERY MODEL 16 SM

MIXER, CONCRETE



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM		PAR REF
1	V-BELTS. Proper adjustment for auxiliary pump drive belts is a deflection of 3/4 inch to 1 inch midway between pulleys.	63
2	AUXILIARY WATER PUMP. Check for leaks.	7
3	WATER TANK GAGE. Check for cracked or broken water gage sight glass. Check for leaks. Clean a dirty sight glass.	32
4	WATER TANK. Check for leaks.	32
5	WATER VALVE AND CONTROL LEVER. Check water valve for leaks. Check control for bent, broken or worn parts.	32
6	LOADING SKIP. Check skip and cable guides for cracks, bent, or broken parts. Check cable for worn or frayed condition.	32
7	TIRES AND WHEELS. Check the tires for proper air pressure, cuts, imbedded foreign matter, missing valve caps, and excessive wear. Correct air pressure is 45 psi. (Weekly)	4
8	HOIST CABLE AND PULLEYS. Check pulley for cracks or breaks. Check for worn or frayed cable.	3

Figure 22. Daily preventive maintenance services.

ITEM		PAR REF
9	FIRE EXTINGUISHER. Check for broken seal.	39 40
10	RADIATOR. Proper coolant level is 2 inches below filler neck.	6
11	V-BELT. Proper adjustment is a deflection of 3/4 to 1 inch midway between generator drive pulley and fan pulley.	63
12	OIL LEVEL GAGE. Add oil as indicated by level gage. Reference current L.O.	43
13	FUEL STRAINER. Tighten thumb nut if gasket is leaking. (Clean weekly)	61
14	BATTERIES. Tighten loose cables and mountings. Remove corrosion. Inspect for cracks and leaks. Fill to 3/8 inch above plates. Clean vent hole in filler cap before installing. In freezing weather run engine a minimum of 1 hour after adding water (Weekly)	64
15	FUEL TANK. Add fuel as required.	6
16	CONTROLS AND INSTRUMENTS. Inspect for damage and loose mounting. With unit operating, check for proper operation. Normal operating readings for instruments are as follows: Coolant temperature gage — 160° to 180°F Oil pressure gage — 20 to 30 psi Tachometer — 2200 rpm The tachometer registers engine speed in revolutions per minute. Ammeter — slight charge fuel gage — indicates amount of fuel in tank.	9 thru 28
	NOTE 1. OPERATION During operation observe for any unusual noise or vibration.	

MSC 3895-219-10/22

Figure 22—Continued.

AGO 9388A

Section IV. TROUBLESHOOTING

47. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the concrete mixer and its components. Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any operational trouble beyond the scope of the operator will be reported to Organizational Maintenance.

48. Engine Hard To Start or Fails To Start

Probable cause	*Possible remedy*
Fuel tank empty	Fill tank (par. 6).
Fuel valves closed	Set valves in proper position (par. 30).
Air cleaner clogged	Service cleaner (par. 44).
Water or dirt in fuel	Service fuel filter; drain fuel tank and fill with clean fuel (par. 61).
Carburetor not choked sufficiently.	Position choke control properly (par. 30).
Carburetor flooded	Open choke control and crank engine to clear cylinders of excess fuel (par. 30).

49. Engine Misses, Runs Erratically, or Lacks Power

Probable cause	*Possible remedy*
Air cleaner clogged	Service cleaner (par. 44).
Water or dirt in fuel	Service fuel filter; drain fuel tank and fill with clean fuel (par. 61).
Choke control improperly positioned.	Position choke control properly (par. 30).

50. Engine Noisy

Probable cause	*Possible remedy*
Crankcase oil level low	Add oil. Refer to current lubrication order.
Fuel of low grade	Drain fuel tank (par. 61). Refer to appendix II and fill with proper grade fuel.

Caution: **If the engine knocks or is noisy when the crankcase is properly filled, and correct grade of fuel is being used, stop the engine immediately and report the condition to Organizational Maintenance. Continued operation can cause serious damage to the engine.**

51. Engine Stops Suddenly

Probable cause	*Possible remedy*
Fuel tank empty	Fill tank (par. 6).
Water or dirt in fuel	Service fuel filter; drain fuel tank and fill with clean fuel (par. 61).

52. Engine Overheats

Probable cause	*Possible remedy*
Coolant level low	Fill cooling system to correct level (par. 6).
Engine crankcase oil level low.	Add oil. Refer to current lubrication order.
Fan V-belt slipping	Adjust belt (par. 63).
Radiator core clogged externally.	Clean core (par. 62).
Engine overloaded	Reduce amount of batch.

53. Engine Has Low or No Oil Pressure

Probable cause	*Possible remedy*
Engine crankcase oil level low	Add oil. Refer to current lubrication order.

54. Engine Exhaust Smoke Excessive

Probable cause	*Possible remedy*
Engine crankcase oil level too high.	Drain oil to proper level. Refer to current lubrication order.
Air cleaner clogged	Service cleaner (par. 44).
Carburetor choked excessively.	Adjust choke control (par. 30).

55. Mixing Drum Not Functioning Properly

Probable cause	*Possible remedy*
Drum overloaded	Reduce amount of batch.
Mixer not level	Level mixer.
Stabilizers not set	Set stabilizers (par. 7).

56. Water System Not Functioning Properly

Probable cause	*Possible remedy*
Water not reaching mixer.	Inspect water supply line for breaks or loose connections. Correct deficiencies or report condition to Organizational Maintenance.
Water not reaching water tank.	Use dual prime pump (par. 7) or report pump malfunction to Organizational Maintenance.

57. Dual Prime Pump Not Functioning Properly

Probable cause	*Possible remedy*
Pump loses prime	Tighten pump drain plug. Inspect for leaks.

Section V. FIELD EXPEDIENT REPAIRS

58. General

Operational troubles may occur while the concrete mixer is operating in the field where supplies and repair parts are not immediately available and normal corrective action cannot be performed. When this condition exists, the following expedient remedies may be used during emergencies, upon the decision of the unit commander. Equipment so repaired must be removed from operation as soon as possible and properly repaired before being placed in operation again.

59. Engine Lacks Power

Trouble	*Expedient remedy*
Air cleaner or hose clogged.	Remove hose and operate unit (par. 44).

Caution: **Replace the air filter or hose promptly as operation with unfiltered air will damage the engine.**

60. Engine Has Low or No Oil Pressure

Trouble	*Expedient remedy*
Oil filter gasket leaks	Remove gasket, turn it over, and reinstall (par. 44).
Oil filter clogged	Remove filter element and operate mixer without it (par. 44).

Caution: **Replace a discarded filter element as promptly as possible. Operation with unfiltered oil may damage the engine.**

Section VI. ENGINE AND ACCESSORIES

61. Fuel Filter, Fuel Tank Strainer, and Fuel Tank

a. Fuel Filter (Serial No. Range 148883 Through 148982). The fuel filter removes water and solid foreign material from the fuel before it reaches the carburetor, and should be serviced frequently.

(1) Close the fuel shutoff valve (3, fig. 23).

(2) Loosen the knurled screw (1) and remove the sediment bowl (7), gasket (6), and bail (2).

(3) Remove the filter element (5) from the fuel filter body (4) by turning ing counterclockwise.

(4) Wash the bowl and element in approved cleaning solvent. Dry thoroughly. Replace a cracked bowl or damaged gasket.

(5) Install the filter element (5) in the body (4).

(6) Install the bowl (7) and gasket (6) and secure with the bail (2). Tighten the screw (1).

(7) Open the fuel shutoff valve (3).

b. Fuel Filter and Fuel Pump (Serial No. Range 153351 Through 153609). The fuel filter is adjacent to the fuel pump, which contains a fuel strainer. The fuel pump is to be serviced at the same time as the fuel filter.

(1) Set the three-way valve (7, fig. 13) in the OFF position.

(2) Remove the hose from the air cleaner and from the carburetor (par. 44).

(3) Loosen the screw (1, fig. 24) and remove the cover (2) from the pump body (5). Remove the screen (3) and gasket (4).

(4) Wash the cover and screen in approved cleaning solvent and dry thoroughly. Replace any damaged part.

(5) Position the gasket (4), screen (3), and cover (2) on the pump body (5) and secure by installing the screw (1).

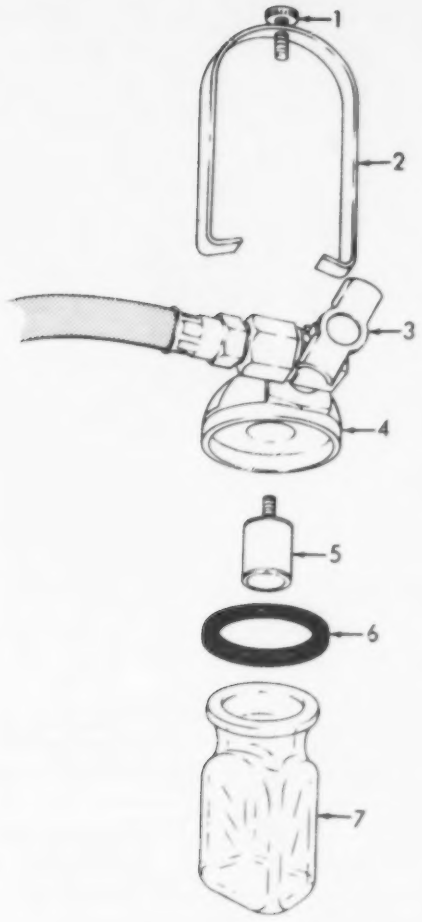
(6) Loosen the knurled nut (8) and swing the bail (7) to one side.

(7) Remove the sediment bowl (11), filter element (10), and gasket (9) from the filter head (6).

(8) Clean the bowl and element in approved cleaning solvent and dry thoroughly. Replace any damaged part.

(9) Position the gasket (9), filter element (10), and sediment bowl (11) on the filter head (6) and secure by swinging the bail (7) into vertical position and tightening the knurled nut (8) against the bowl.

(10) Make sure the shutoff valve (12) is fully open.



EMC 3895-219-10/19

1 Knurled screw
2 Bail
3 Fuel shutoff valve
4 Fuel filter body
5 Filter element
6 Gasket
7 Sediment bowl

Figure 23. Fuel filter, partially exploded view (serial No. range 148883 through 148982).

(11) Install the hose on the air cleaner and on the carburetor (par. 44).

(12) Place the three-way valve (7, fig. 13) in the proper operating position and check for fuel leaks around the fuel pump and fuel filter.

c. Fuel Filler Cap and Fuel Tank Strainer.

(1) Turn the fuel filler cap (1, fig. 25) counterclockwise and remove.

(2) Remove the fuel tank strainer (2) from the fuel tank (3).

(3) Wash the cap and strainer in approved cleaning solvent, and dry thoroughly. Make sure breather openings in the cap are not obstructed.

(4) Insert the strainer (2) in the tank (3) and install the cap (1).

d. Fuel Tank (Serial No. Range 148883 Through 148982). Drain the fuel tank to remove dirt, water, or other contaminates.

(1) Remove the fuel drain plug (3, fig. 11) and provide a suitable container for the fuel to be drained into.

(2) Open the fuel tank draincock (3, fig. 5) and drain the entire fuel supply into the container provided.

(3) Close the fuel tank draincock and install the drain plug.

(4) Dispose of the contaminated fuel. Fill the fuel tank (par. 6).

e. Fuel Tank (Serial No. Range 153351 Through 153609). Drain the fuel tank to remove contaminated fuel.

(1) Remove the fuel drain plug (7, fig. 6) and provide a suitable container into which the fuel may be drained.

(2) Open the fuel tank draincock (2) and drain the entire fuel supply into the container provided.

(3) Close the fuel tank draincock and install the drain plug.

(4) Dispose of the contaminated fuel. Fill the fuel tank (par. 6).

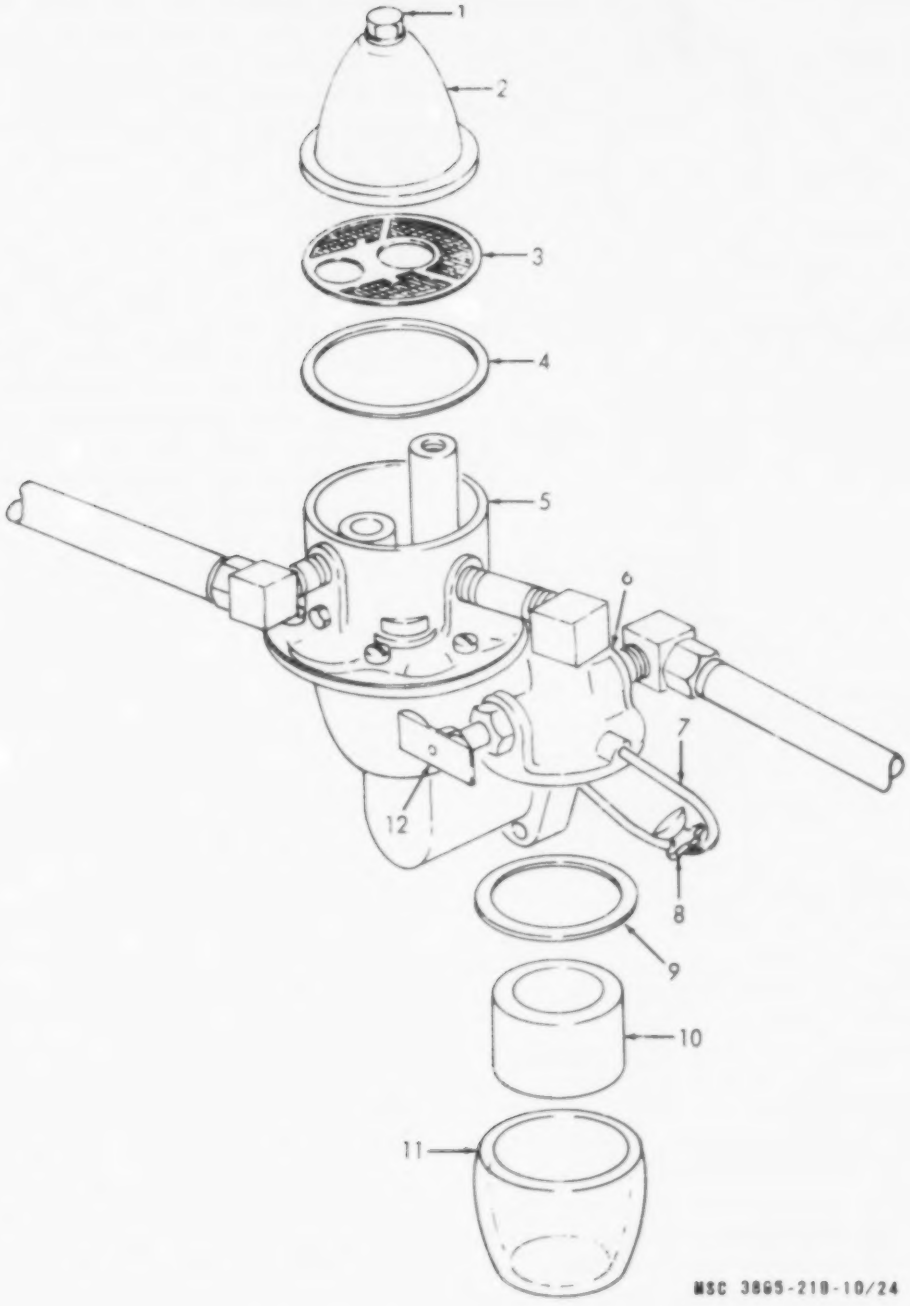
62. Cooling System

a. General. Clean the radiator externally at frequent intervals. Direct compressed air through the radiator core to remove dirt and foreign matter. See that the cooling system is drained and flushed at least twice a year, or before and after antifreeze changes.

b. Refer to paragraph 6 and service the cooling system.

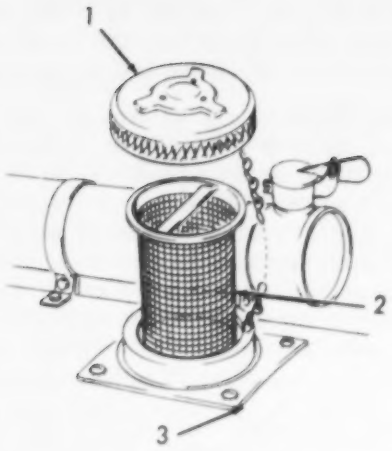
63. Fan V-Belt

a. General. The fan, water pump, and engine generator are driven from the crankshaft pulley by the fan V-belt. Correct belt tension must be maintained to prevent the engine from overheating and to keep the engine generator func-



1	Screw (spec)	4	Gasket	7	Bail	10	Filter element
2	Cover	5	Pump body	8	Knurled nut	11	Sediment bowl
3	Screen	6	Filter head	9	Gasket	12	Shutoff valve

Figure 24. Fuel pump and fuel filter, partially exploded view (serial No. range 153351 through 153609).



EMC 3895-219-10/20

1 Fuel filler cap
2 Fuel tank strainer
3 Fuel tank

Figure 25. Fuel filler cap and fuel tank strainer.

tioning properly.

b. Adjustment.

(1) Loosen the screw (3, fig. 26) that secures the generator (4) to the adjusting bracket (2).

(2) Move the generator toward or away from the engine until the tension of the V-belt (6) allows a deflection of ½ to ¾ inch when pressed midway between the generator pulley (5) and the fan pulley (1).

(3) Tighten the screw (3) to secure the generator (4) to the adjusting bracket (2).

(4) Recheck the belt tension.

64. Batteries

a. General. The concrete mixer is equipped with the two 12-volt batteries (11, fig. 7) connected in series by a jumper cable (5) to provide 24 volts for the engine electrical system. The batteries should be kept as fully charged as possible to provide sufficient engine starting power, especially during cold weather.

b. Cleaning and Inspection.

(1) Clean the quick disconnectors (2), holddowns (8), and holddown rods (6) with a wire brush or a solution of bicarbonate of soda and water. Clean the batteries (11) with a clean, dry cloth. Make sure the vent holes in the filler caps (4) are not obstructed.

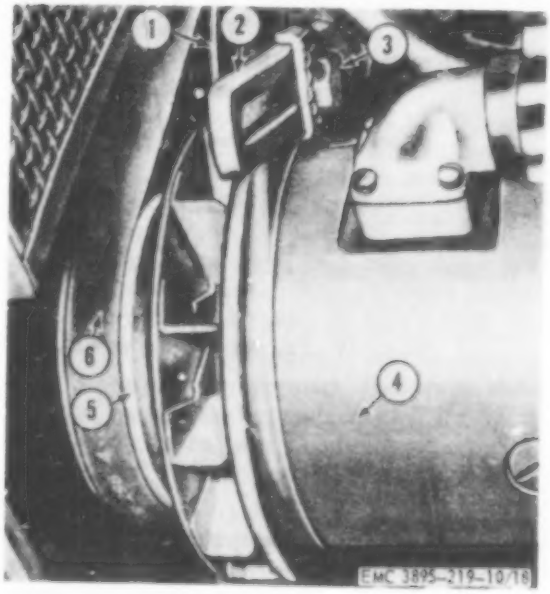
(2) Inspect the batteries and cables (3, 5, and 9) for breaks, cracks, loose terminals, and broken or missing caps.

(3) Apply a light coat of grease to the metal parts to prevent corrosion.

(4) Report deficiencies to Organizational Maintenance.

65. Panel Light (Serial No. Range 153351 Through 153609)

a. General. The panel light (9, fig. 13) is equipped with an on-off switch; a 28-volt, 1.7-amp, 3-candlepower, bayonet-base type lamp; and a reflection shield



1 Fan pulley
2 Adjusting bracket
3 Screw, cap, ⅜-24 x ⅞ in.
4 Generator
5 Generator drive pulley
6 V-belt

Figure 26. Fan V-belt adjustment.

b. Cleaning and Inspection.

(1) Inspect the light and reflection shield for damage and insecure mounting. Inspect the on off switch for proper operation. Report deficiencies to organizational maintenance.

(2) Replace a defective lamp.

c. Lamp Replacement.

(1) Remove the reflection shield.

(2) Remove the lamp by pressing inward and turning counterclockwise.

(3) Install a new lamp in the panel light socket by pressing in and turning clockwise.

(4) Install the reflection shield.

(5) Test the lamp by turning the on-off switch clockwise.

66. Skip Brake

a. General. The loading skip (2, fig. 3) is raised by engaging the skip clutch (19). Since the skip will lower itself by gravity, a skip brake (13) is provided to prevent uncontrolled lowering when the skip clutch is disengaged. The brake should be adjusted so that it will hold the skip in any position; by manipulation of the skip brake lever (4), the lowering of the skip is then controllable by the operator.

b. Adjustment.

(1) Fully loosen the locknut of the brake spring eyebolt (11, fig. 3) by turning it counterclockwise.

(2) Turn the adjusting nut of the eyebolt clockwise to compress the skip brake spring (10) and tighen the skip brake; turn the adjusting nut counterclockwise to loosen the skip brake.

(3) Turn the locknut fully clockwise to tighen it against the adjusting nut.

(4) Make certain that when the brake (4) is moved to its extreme forward position the skip brake is fully released. Readjust the brake to attain this result or notify Organizational Maintenance if it is unattainable.

CHAPTER 4

DEMOLITION OF THE CONCRETE MIXER TO PREVENT ENEMY USE

67. General

When capture or abandonment of the concrete mixer to an enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or to render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the same vital parts of all concrete mixers and all corresponding repair parts.

68. Demolition To Render the Concrete Mixer Inoperative

a. Demolition By Misuse. Perform the following steps to make the mixer inoperative:

(1) Drain the engine crankcase and radiator.

2() Remove the spark plugs, pour sand into the cylinders, and replace the spark plugs.

(3) Load the skip and water tank, start the engine, charge the drum, and mix a batch of concrete. Stop the engine and leave the batch in the mixing drum.

(4) Slash or puncture the tires.

b. Demolition By Mechanical Means. Use sledge hammers, crowbars, picks, axes, or other tools which may be available, together with the tools normally included with the concrete mixer, to destroy the following:

(1) Engine magneto.

(2) Main drive spur gear.

Note. The above steps are the minimum requirement for this method.

(3) Power transfer.

(4) Loader skip clutch.

(5) Dual prime pump.

(6) Engine carburetor.

(7) Engine radiator.

69. Demolition by Explosives or Weapon's Fire

a. Demolition By Explosives. Place as many of the following charges (fig. 27) as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(1) *Concrete mixer.*

(*a*) One ½-pound charge on the main spur drive gear.

(b) One ½-pound charge on the skip loader clutch cone.

Note. The above charges, when used with the minimum charges for demolition of the engine on the mixer, are the minimum requirements for this method.

(2) *Engine.*

(*a*) One ½-pound charge under the intake manifold.

Note. The above charges are the minimum requirements on this engine for this method.

(*b*) One ½-pound charge between the starter and engine block.

(*c*) One ½-pound charge between the generator and engine block.

(*d*) One ½-pound charge under clutch and drive gear.

b. Demolition By Weapons' Fire. Fire on the concrete mixer with the heaviest suitable weapons available. Direct fire at engine and at mixer clutch and controls.

70. Other Demolition Methods

a. Demolition By Scattering and Concealment. Remove all easily accessible vital parts such as the carburetor, magneto, spark plugs, loader skip brake band, and main drive spur gear and scatter them through dense foliage, bury them in dirt or sand, or throw them in a lake, stream, or other body of water.

b. Demolition By Burning. Pack rags, clothing, or canvas under and around the mixer engine. Saturate this packing with gasoline, oil, or diesel fuel and ignite.

c. Demolition By Submersion. Totally submerge the concrete mixer in a body of water to provide water damage and concealment. Salt water will do greater damage than fresh water.

71. Training

All operators should receive thorough training in the destruction of the concrete mixer.

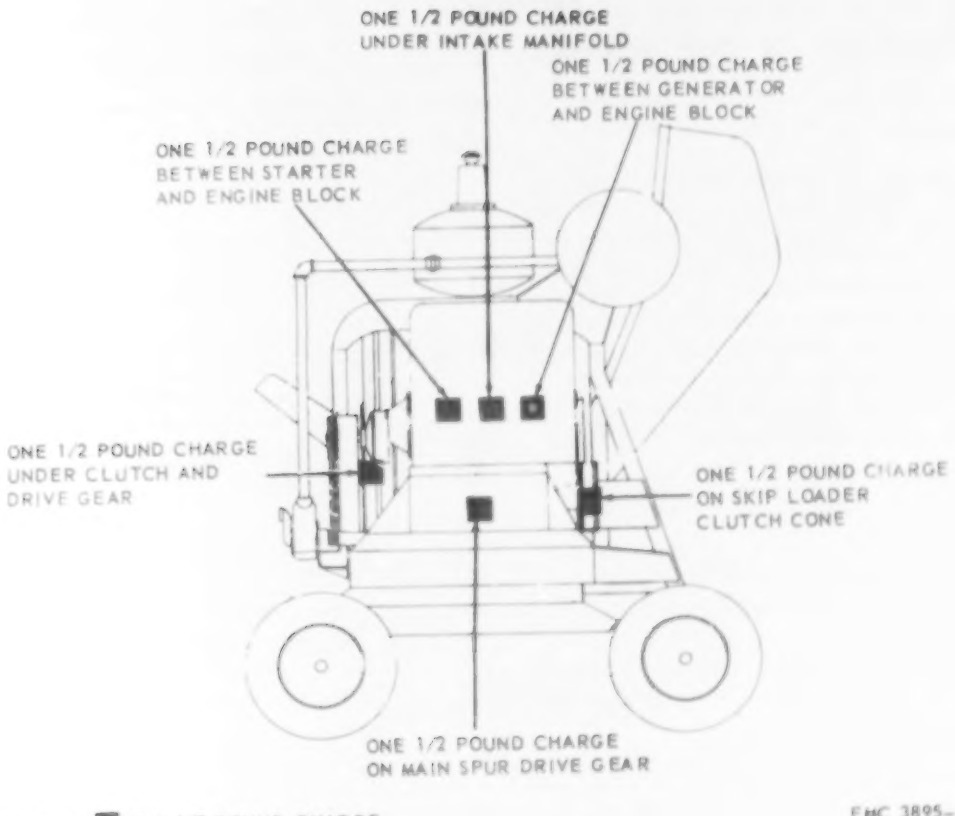


Figure 27. Placement of charges.

Refer to FM 5–25. Simulated destruction, using all the methods listed above, should be included in the operator training program. It must be emphasized in training that demolition operations are usually necessitated by critical situations when available for carrying out destructions when time available for carrying out destruction is limited. For this reason, it is necessary that operators be thoroughly familiar with all methods of destruction of equipment and be able to carry out demolition instructions without reference to this or any other manual.

APPENDIX I
REFERENCES

1. Dictionaries of Terms and Abbreviations

AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.

2. Fire Protection

SB 5–111	Extinguisher, Fire, Monobromotrifluoromethane (CF_3BR, Charged) FSN 4210–555–8837.

3. Lubrication

LO 5–3895–219–20–1	Mixer, Concrete, Trailer Mounted; 16 Cu Ft (Construction Machinery Model 16SM) W/Engine Continental Model YS116.
LO 5–3895–219–20–2	

4. Painting

TB ENG 60	Preservation and Painting of Serviceable Corps of Engineers Equipment.

5. Preventive Maintenance

AR 750–5	Maintenance Responsibilities and Shop Operations.
TM 9–6140–200–15	Storage Batteries, Lead-Acid Type.
TM 38–750	Army Equipment Record System and Procedures.

6. Publication Indexes

DA Pam 310–2	Index of Blank Forms.
DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.

7. Supply Publications

SM 10–C9100–SL	Petroleum, Petroleum-Base Products, and Related Material.
TM 5–3895–219–20P	Mixer, Concrete, Trailer Mounted: Gasoline Driven; 16 Cu Ft (Construction Machinery Model 16SM) FSN 3895–807–7985.

8. Training Aids

FM 5–25	Explosives and Demolition.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instructions.
FM 21–30	Military Symbols.

APPENDIX II

BASIC ISSUE ITEMS LIST AND MAINTENANCE AND OPERATING SUPPLIES

Section I. INTRODUCTION

1. General

Section II lists the accessories, tools, and publications required in 1st echelon maintenance and operation, initially issued with, or authorized for the concrete mixer. Section III lists the maintenance and operating supplies required for initial operation.

2. Explanation of Columns Contained in Section II

a. Source Codes. The information provided in each column is as follows:

(1) *Technical service.* This column lists the basic number (or symbol) of the technical service assigned supply responsibility for the part. Blank spaces denote Corps of Engineer supply responsibility. General Engineer supply parts are identified by the letters GE in parentheses, following the nomenclature in the description column. Other technical services basic numbers (or symbols) are—

3—Chemical Corps
9—Ordnance Corps
10—Quartermaster Corps
12—Adjutant General's Corps

(2) *Source.* The selection status and source of supply for each part are indicated by one of the following code symbols:

(*a*) P—Applied to high-mortality repair parts which are stocked in or supplied from the technical service depot system, and authorized for use at indicated maintenance echelons.

(*b*) P1—applied to repair parts which are low-mortality parts, stocked in or supplied from technical service depots, and authorized for installation at indicated maintenance echelons.

(*c*) M—applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance echelons.

(*d*) X2—applied to repair parts which are not stocked. The indicated maintenance echelon requiring such repair parts will attempt to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through normal supply channels.

(3) *Maintenance.* The lowest maintenance echelon authorized to use, stock, install, or manufacture the part is indicated by the following code symbol:

O—Organizational Maintenance (1st and 2d Echelon)

(4) *Recoverability.* Repair parts and/or tool and equipment items that are recoverable are indicated by one of the following code symbols:

(*a*) R—applied to repair parts and assemblies which are economically repairable at field maintenance facilities (3d and 4th echelons) and normally are furnished by supply on an exchange basis.

(*b*) T—applied to high-dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance facilities.

(*c*) U—applied to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high-dollar value reusable casings, castings, and the like.

b. Federal Stock Numbers. When a Federal stock number is available for a part, it shall be shown in this column, and used for requisitioning purposes.

c. Description.

(1) The item name and a brief description of the part are shown.

(2) A five-digit Federal supply code for manufacturers and/or other technical services is shown in parentheses followed by the manufacturer's part number. This number shall be used for requisitioning purposes when no Federal stock number is indicated in the Federal stock number column. *Example:* (08645) 86453

(3) The letters GE, shown in parentheses immediately following the description, indicate General Engineer supply responsibility for the part.

d. Unit of Issue. If no abbreviation is shown in this column, the unit of issue is "each".

e. Quantity Authorized. This column lists the quantities of repair parts, accessories, tools, or publications authorized for isue to the equipment operator or crew as required.

f. Quantity Issued with Equipment. This column lists the quantities of repair parts, accessories, tools, or publications that are initially issued with each item of equipment. Those indicated by an asterisk are to be requisitioned through normal supply channels as required.

g. Illustrations. This column is subdivided into two columns which provide the following information:

(1) Figure number. Provides the identifying number of the illustration.

(2) *Item number.* Provides the referenced number for the parts shown in the illustration.

3. Index to Federal Supply Code for Manufacturers

14341 . . . Continental Motors Corp.

4. Explanation of Columns Contained in Section III

a. Item. This column contains numerical sequenced item numbers, assigned to each component application, to facilitate reference.

b. Component Application. This column identifies the component application of each maintenance or operating supply item.

c. Source of Supply. This column lists the basic number of the technical service assigned supply responsibility for the item. Those spaces left blank denote Corps of Engineers supply responsibility. Other technical services basic numbers are—

3—Chemical Corps
9—Ordnance Corps
10—Quartermaster Corps
12—Adjutant General's Corps

d. Federal Stock Number. When a Federal stock number is available it shall be shown in this column and used for requisitioning purposes.

e. Description. The item name and a brief description are shown.

f. Quantity Required for Initial Operation. This column lists the quantity of each maintenance or operating supply item required for initial operation of the equipment.

g. Quantity Required for 8 Hours Operation. Quantities listed represent the estimated requirements for an average 8 hours of operation.

h. Notes. This column contains informative notes keyed to data appearing in the preceding columns.

5. Comments and Suggestions

Suggestions and recommendations for changes to the Basic Issue Items List and/or Maintenance and Operating Supplies Table shall be submitted on DA Form 2028 to the Commanding Officer, U. S. Army Mobility Support Center, ATTN: SMOMS–MS, Box 119, Columbus 16, Ohio. Direct communication is authorized.

Section II. BASIC ISSUE ITEMS LIST

Source codes				Federal stock No.	Description	Unit of issue	Expendability	Quantity authorized	Quantity issued with equipment	Illustration	
Technical service	Source	Maintenance	Recoverability							Figure	Item
					GROUP 01—ENGINE						
					0114—ENGINE STARTING SYSTEM						
	X2	O			CRANK, STARTING: engine (14351) PY116-309.			1	1		
					GROUP 06—ELECTRICAL SYSTEM						
					0612—BATTERIES						
11	P	O		6140-057-2553	BATTERY, STORAGE: 6-cell, 21-volt, 45-amp (96906) MS35000-1.			2	2		
3	P	O		6810-249-9354	SULFURIC ACID: electrolite	GAL		2	2		
					GROUP 26—ACCESSORIES, PUBLICATIONS, TEST EQUIPMENT AND TOOLS						
					2602—ACCESSORIES						
10	P	O		7520-559-9618	CASE, MAINTENANCE AND OPERATIONAL MANUALS: cotton duck, water-repellent, mildew-resistant.			1	1		
					2603—COMMON TOOLS						
10	P	O		5120-224-4047	HAMMER, HAND: machinist ball peen, 2 lb.			1	*		
10	P	O		5120-264-3796	WRENCH, OPEN END, ADJUSTABLE: single head, 0-to 1 5/16-in. jaw opening 12 in. lg.			1	*		
10	P	O		5120-277-1461	WRENCH, PIPE: adjustable, 1-to 2-in. pipe, 18 in. lg.			1	*		
10	P	O		5120-223-7396	PLIERS, SLIP JOINT: straight nose w/cutter 6 in. lg.			1	*		
10	P	O		4930-360-2801	GREASE GUN, HAND: lever operated, 16-oz capacity w/extension 7 in. lg and hydraulic coupler.			1	*		
10	P	O		4920-274-5713	OILER, HAND: 5-oz capacity			1	*		
					2605—PUBLICATIONS						
12					DEPARTMENT OF THE ARMY LUBRICATION ORDER LO 5-3895-219-20-1 LO 5-3895-219-20-2.			1	1		
12					DEPARTMENT OF THE ARMY OPERATOR'S MAINTENANCE MANUAL TM 5-3895-219-10 TM 5-3895-219-20P.			2	2		

Source codes				Federal stock No.	Description	Unit of issue	Expendability	Quantity authorized	Quantity issued with equipment	Illustration	
Technical service	Source	Maintenance	Recoverability							Figure	Item
					GROUP 76—FIRE FIGHTING EQUIPMENT						
					7603—FIRE EXTINGUISHERS						
	P1	O		4210-893-1092	EXTINGUISHER, FIRE, DRY CHEMICAL: charged; hand; class 4B, with universal bracket 2½ lb. (GE). (Used on mixer serial Nos. 153351 through 153609 only.)			1	1		
	P1	O		4210-555-8837	EXTINGUISHER, FIRE, MONOBROMOTRIFLUOROMETHANE: CF_3 Br: charged, hand shatterable cylinder, penetrating seal valve, stored pressure, w/bracket, 2.75 lb (Halon-1301) MIL-SPEC E 52031 (GE). serial Nos. 148883 through 148982 only).			1	1		

Section III. MAINTENANCE AND OPERATING SUPPLIES

Item	Component application	Source of supply	Federal stock number	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
1	0101 CRANKCASE (1)			OIL, LUBRICATING: 5-gal pail as follows:			(1) Includes quantity of oil to fill engine oil system as follows: 4 qt—crankcase 1 qt—oil filter
		10	9150-265-9435	OE-30	5 qt	(3)	
		10	9150-265-9428	OE-10	5 qt	(3)	(2) Use oil as prescribed in item 1.
		10	9150-242-7603	OES	5 qt	(3)	(3) See current LO for grade application and replacement intervals.
2	0204 Air CLEANER serial No. (2) 148883 through 148982.			OIL, LUBRICATING:	½ qt (2)	(3)	
	Serial No. 153-351 through 153609.				1 qt (2)	(3)	(4) Tank capacity.
3	0306 TANK FUEL.	10	9130-264-6218	GASOLINE AUTOMOTIVE: bulk.	7 gal (4)	19.52 (5)	(5) Average fuel consumption is 2.44 gph of continuous operation.
4	0501 COOLING SYSTEM.			WATER:	7 qt (6)		
		9	6850-243-1992	ANTIFREEZE: ethylene glycol 1-gal can	4 qt		
		9	6850-174-1806	ANTIFREEZE: arctic 55-gal drum.	7 qt (6)		(6) Radiator capacity.
							(7) Use grease as prescribed in item 6.

Item	Component application	Source of supply	Federal stock number	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
5	0800 POWER TRANSFER ASSEMBLY	10 10	9150-751-2635 9150-261-7904	LUBRICATING OIL, gear 1-qt can Go 90 GOS. GREASE, Automotive and Artillery 5-lb can.	1 qt 1 qt		(8) Use lubricating oil as prescribed in item 8. (9) Use lubricating oil as prescribed in item 8.
6	1311 WHEEL BEARINGS.	10	9150-190-0905	GAA	as req	(3)	
7	4701 TACHOMETER DRIVE.			GREASE (7)	as req	(3)	
8	7301 POWER LOADER SKIP CABLE.	10	9150-246-3276	OIL, LUBRICATING: exposed gear 35-lb pail. CW-11B	as req	(3)	
9	7302 DRUM GEAR.			OIL, LUBRICATING: exposed gear (8).	as req	(3)	
10	7305 MAIN DRIVE.			LUBRICATING OIL, Gear (9).	⅜ qt	(3)	
11	FITTINGS GREASE.			GREASE (7)	as req	(3)	

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By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army
Chief of Staff.

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J. C. LAMBERT,
Major General, United States Army,
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55–500 EL

NG: None.
USAR: Same as active army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320–50.

☆U.S. GOVERNMENT PRINTING OFFICE: 1990 - 262-912/30566

PIN : 012290-000